City of Newport Beach
Water Quality/Coastal Tidelands Committee Minutes

Date: April 10, 2014
Time: 3:00 p.m.
Location: Newport Coast Conference Room, 2nd Floor, Bay E

1. **Welcome/Self Introductions**
   Committee Members present:
   Chairwoman/Council Member Nancy Gardner
   Council Member Mike Henn
   Dennis Baker
   Carl Cassidy
   George Robertson
   Tom Houston
   Lou Denger
   Michael Melby

   Guests present:
   Jim Mosher, resident
   Jeff Coffman, Clean Green Technology
   Michelle Nidever, O.C. Coastkeeper
   Darrel Ferguson, Surfrider Foundation
   Greg Goran, Surfrider Foundation
   Philip Bettencourt, Bettencourt & Associates
   Ray Heimstra, O.C. Coastkeeper
   Adam Gale, Anchor QEA
   Shelly Anghera, Ph.D., Anchor QEA

   Staff present:
   Dave Kiff, City Manager
   John Kappeler, Water Quality Manager
   Shane Burckle, Water Conservation Coordinator
   Shari Rooks, Public Works Specialist
   Bob Stein, Assistant City Engineer
   Chris Miller, Harbor Resources Manager

   The agenda for the Water Quality/Coastal Tidelands Committee was posted at 4:05 pm on April 3, 2014, in the binder located in the entrance of the Council Chambers at 100 Civic Center Drive.

2. **Approval of Previous Meeting's Minutes**
   The February 13, 2014 and the March 13, 2014 meeting minutes were approved.

3. **Old Business**
   a. **Bay and Ocean Bacteriological Test Results**
      John Kappeler reviewed recent water quality test results within Newport Bay and along the ocean shoreline.

b. **2014 Committee Goals and Priorities**

Nancy Gardner advised Committee that Council voted to move the Irvine Avenue medians to the top of the committee's recommended list for turf removal locations so that the median work can be incorporated in the upcoming Irvine Avenue capital improvement project.

- Several of the Homeowner's Associations have been contacted regarding street sweeping and catch basin cleaning.
- The 3rd week of May and the 3rd week of June are expected to have extreme low tides so those times are targeted for the "Arches" drain dry weather sampling project.
- We have grant money for wet weather sampling, but we may not have any more wet weather between now and the end of June when **John Kappeler** brings the testing results to the committee.

4. **New Business**

a. **Chris Miller** introduced **Shelly Anghera, Ph.D.** from Anchor QEA and she gave an overview on the **Proposed Newport Bay Copper Total Maximum Daily Load (TDML)** for Newport Bay. Please see attached presentation.

- The City is at the stage in the TMDL process where we are developing an implementation plan.
- In order to be de-listed from the Copper TMDL the Regional Board requires that 90% of the data that we collect is below the numeric target of 3.1 µg/L. Currently we do not know if 3.1 is the right number – it is a very conservative, over-protective number.
- What we have learned from the results of 4 tests done by Anchor QEA and 20 tests done by Orange County Coast keeper is that no copper toxicity was observed in the water samples in Newport Bay – however there is observed toxicity in the sediment.
- **Ray Heimstra** noted that Coastkeeper's tests of copper toxicity estimated 5,000 pounds per year came from storm drains, 7,000 pounds per year came from mid-channel and 50,000 pounds per year came from boats.
- We need to find out what the implementation plan will say and how the Regional Board will enforce the copper limits.
- Non-Voluntary Actions to meet TMDLs should include reducing the number of boats with copper boat paint; implementing a monitoring program; add permit compliance requirements and support the Department of Pesticide Regulation for antifouling paint limit of 9.5 µg/L.
- Voluntary Actions to meet TMDLs should include developing site-specific copper criteria; public education and outreach; and implementing best management practices.
- City needs to evaluate the effectiveness of developing a new water quality criteria for Newport Bay that would demonstrate that 5.0 µg/L is protective and represents 80% of the bay. This could take up to a year of negotiations with the Regional Board and the Environmental Protection Agency at a cost of $150,000.
- City should work together with other cities and counties to share data and consider doing some initial testing using the less expensive Biotic Ligand Model (BLM) alongside the expensive Water Effects Ratio (WER) to demonstrate that results from the BLM tests are accurate.

- Both **Shelly Anghera** and **Ray Heimstra** referenced the study done by Leigh T. Johnson and Jamie A. Gonzalez of the University of California in 2007 describing the effects on invasive species and the ecosystem by the potential statewide ban of copper-based antifouling paints in California. See link below to view the study: http://www.csc.noaa.gov/cz/CZ07_Proceedings/PDFs/Monday_Abstracts/3360.Gonzalez.pdf

b. Adopting a natural Source Exclusion

Committee discussion on the status of the Fecal Coliform TMDL and adopting a natural source exclusion. The way the current TMDL is written, we are currently meeting our bacteria TMDL everywhere except one spot – the Newport Boulevard Bridge and unless the Regional Board revises the TMDL the City will not be able to comply by the deadline at the end of this year. The City has installed a bioswale, CDS units and trash skimmers, but we are still exceeding the limits. **John Kappeler** met with some people from UCLA and will be doing the two dry weather sampling events in May and June so they can be speciated and DNA typed to determine if it is plant-based bacteria, natural bacteria or if it is a human sewage bacteria. The results of the dry weather study will be presented to the Regional Board.

- Santa Monica Bay's Natural Source Exclusion allows them a certain number of days (16) that they are permitted to exceed the limit.
- If the City wants to convince the Regional Board that no swimming or water contact occurs at the Newport Boulevard Bridge site it will be necessary to document that fact using cameras similar to the procedure used by O.C. Coastkeeper – taking pictures every 15 minutes for a period of 6 months.

ACTION: Look into having someone from Santa Monica come to a meeting and explain what process they followed to be granted a Natural Source Exclusion.

c. Orange County Transportation Authority (OCTA) Tier I Grant Program Submittals

- **Surfrider** would like to partner with the City on the median turf replacements, specifically the median across from the Crab Cooker near the Newport Pier as the site for an Ocean Friendly garden and educational signage.
- **Mike Henn** noted that Council may approve new landscaping down the peninsula that would tie in with the plant palate used for new landscape on Balboa Boulevard and asked that the plant palette for the median at Newport Pier be similar.

d. OCTA Tier II Grant Program Awards

- Bayview Heights Restoration/Mitigation Project – Total Project: $485,000, Grant Funds $305,000, Match $180,000 (Match funds will be paid for by the two private property owners and the County of Orange.)
- Corona del Mar Water Quality Improvement Project – Total Project: $360,000, Grant Funds $250,000, Match $110,000 (Some of the Match funds can be written off on staff time so the actual cost to the General Fund will be close to $80,000.)
- Big Canyon Restoration/Wetlands Project – Total Project: $2,275,400, Grant Funds $1,592,780, Match $682,620 (Match funds will be provided by the Irvine Company and Defend the Bay – no impact to the General Fund.)

5. **Public Comments on Non-Agenda Items**
   - Newport Beach Surfrider has teamed up with Orange County Public Works in the past to get into the Santa Ana River Channel twice a year to clean up the trash. One of the difficult parts of this cleanup is the layer of silt built up just south of Talbert Avenue and north of the 405 Freeway. **Darrel Ferguson** would like to work on a BMP to remove the silt. The next cleanup of this area will be April 26th and the crews will gather at Talbert Avenue.

6. **Topics for Future Agendas**
   (a) Bacteriological Dry-Weather Runoff Gutter Study (Phase III)
   (b) Prop 84 ASBS Grant Program
   (c) Senate Bill – SB 1447
   (d) Eelgrass Program
   (e) Trash Project for Storm Drains
   (f) Harbor Commission Copper Report
   (g) Orange County Coastal Regional Sediment Management Plan
   (h) Sediment Quality Objectives (SOQs)
   (i) NPDES Fifth Term Draft Permit
   (j) Adopting a Natural Source Exclusion
   (k) Banning Ranch
   (l) Grey Water

7. **Set Next Meeting Date**
   The next meeting date was set for May 8, at 3 PM in the **Newport Coast Conference Room, Bay E, 2nd Floor.**

8. **Adjournment**
   The meeting was adjourned at 4:50 pm.

Chairwoman / Nancy Gardner

Health Care Agency / Environmental Health Newport Bay Bacteriological Monitoring Program
Total Coliform (TC), Fecal Coliform, Enterococcus (ENT) Colony Forming Units / 100 ml Sample

STATION	Location Description		12/2/13	12/9/13	12/16/13	12/23/13	12/30/13	1/6/14	1/13/14	1/21/14	1/27/14	2/3/14	2/10/14	2/18/14	2/24/14	3/3/14	3/10/14	3/17/14	3/24/14	3/31/14	4/7/14
NEWPORT BAY (Lower Bay)			RAIN	RAIN								RAIN				RAIN					
BNB09	43rd Street Beach	TC	20	200	20	40	50	20	370	20	10	140	20	50	10	>1340	190	>30	>110	>10	60
		FC	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	<10	<10	30	<10	<10	<10	<10	<10
		ENT	10	20	4	4	2	6	2	<2	6	26	10	2	8	20	20	2	6	<2	<2
BNB10	38th Street Beach	TC	60	140	20	<10	>390	<10	50	10	110	>8600	10	<10	>820	>720	80	<10	>200	<10	<10
		FC	<10	<10	<10	<10	<10	<10	<10	<10	<10	330	<10	<10	10	<10	<10	<10	10	<10	<10
		ENT	48	20	10	2	246	2	8	2	4	180	2	4	86	4	28	<2	46	4	10
BNB11	33rd Street Channel	TC	>130	>370	70	330	130	<10	2000	<10	170	>840	>1420	40	80	270	>210	10	110	<10	30
		FC	10	<10	10	<10	50	<10	<10	<10	<10	70	50	<10	<10	10	20	<10	<10	<10	<10
		ENT	68	24	44	2	46	4	10	2	4	10	56	8	4	4	84	<2	22	2	6
BNB32	Lido Yacht Club Beach	TC	80	>1500	<10	<10	40	<10	<10	<10	30	<10	240	<10	20	6000	30	>10	>21600	<10	<10
		FC	10	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	50	<10	<10	80	<10	<10
		ENT	<2	6	4	<2	<2	<2	4	2	<2	<2	<2	<2	4	28	<2	<2	1000	2	<2
BNB07	Via Genoa Beach	TC	60	>630	10	30	220	20	<10	<10	10	300	10	10	10	8600	<10	<10	10	10	20
		FC	10	10	<10	<10	50	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10
		ENT	34	86	<2	4	>56	10	<2	2	20	20	<2	<2	4	96	2	<2	<2	2	<2
BNB35	Newport Blvd. Bridge	TC	>330	>940	>720	10	>8000	2800	>560	>1530	>40000	>1000	>6800	>1300	>17000	880	>8000	>400	>570	80	>6200
		FC	30	<10	50	<10	160	<10	20	50	9200	130	180	130	1170	70	450	<10	95	<10	260
		ENT	78	38	140	10	2000	2	228	4	8400	24	250	32	2000	10	226	2	226	<2	251
BNB12	Rhine Channel	TC	<10	>1480	10	400	40	70	<10	10	>530	<10	180	70	20	>700	20	10	>350	60	20
		FC	<10	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	50	<10	<10	<10	<10	<10
		ENT	<2	<2	<2	<2	<2	<2	<2	4	26	<2	<2	<2	2	<2	<2	<2	20	<2	6
BNB14	19th Street Beach	TC	30	>1910	<10	10	<10	<10	<10	<10	<10	<10	<10	260	<10	4800	<10	10	10	150	10
		FC	<10	120	<10	<10	<10	<10	<10	<10	<10	<10	<10	80	<10	150	<10	<10	<10	<10	<10
		ENT	10	86	<2	<2	2	<2	<2	<2	<2	<10	<2	4	<2	20	<2	<2	<2	2	<2
BNB15	15th Street Beach	TC	95	>140	20	10	>100	30	120	<10	>940	40	>40	<10	30	4600	>440	40	>60	<10	30
		FC	<10	<10	<10	10	>80	<10	<10	<10	<10	<10	>10	<10	<10	140	<10	10	10	<10	<10
		ENT	4	10	8	<2	50	<2	<2	<2	4	10	2	6	<2	36	26	2	2	4	<2
BNB17	10th Street Beach	TC	60	>8000	80	10	10	10	95	10	30	80	<10	20	10	6000	20	10	>20	10	<10
		FC	<10	50	20	<10	<10	<10	10	<10	10	<10	<10	<10	<10	220	<10	<10	<10	<10	<10
		ENT	2	24	2	2	<2	<2	<2	<2	46	2	2	2	<2	32	<2	4	2	20	<2
BNB18	Alvarado/ Bay Isle Beach	TC	50	>1210	10	30	2200	40	10	20	<10	10	40	10	20	13000	20	10	<200	10	100
		FC	<10	<10	<10	<10	2400	20	<10	<10	<10	<10	<10	10	<10	290	<10	<10	<10	<10	<10
		ENT	4	<2	2	2	2000	4	6	2	2	4	22	8	<2	100	4	10	20	<2	10
BNB22	N Street Beach	TC	30	>220	10	10	>150	10	20	<10	<10	10	30	20	<10	920	20	20	50	<10	30
		FC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	10	20	<10	<10	<10	<10
		ENT	<2	<2	6	<2	130	<2	<2	<2	<2	2	<2	<2	<2	2	28	<2	4	<2	4
BNB31	Garnet Avenue Beach	TC	170	>1480	10	20	60	<10	10	20	30	>440	40	30	70	8000	40	190	>70	10	>270
		FC	40	10	<10	<10	<10	<10	<10	<10	<10	200	<10	10	10	180	20	<10	<10	<10	110
		ENT	100	10	50	<2	279	8	2	2	24	10	2	4	26	54	2	38	<2	74	6
BNB03	Ruby Avenue Beach	TC	4800	>480	<10	100	330	<10	10	20	130	>310	<10	10	<10	6600	<10	50	>30	30	<10
		FC	740	30	10	20	50	<10	<10	<10	40	<10	<10	<10	<10	95	<10	<10	10	<10	<10
		ENT	>52	2	<2	<2	6	2	2	10	80	20	26	<2	<2	32	6	2	10	<2	6
BNB20	Sapphire Avenue Beach	TC	40	380	10	50	40	130	10	30	130	10	<10	40	10	700	>50	>40	120	>100	NS
		FC	<10	20	20	<10	<10	80	10	<10	30	<10	<10	<10	<10	30	<10	10	<10	10	NS
		ENT	10	10	6	2	10	2	2	<2	50	<2	2	4	8	10	10	10	20	4	NS
BNB34	Grand Canal	TC	40	>80	50	100	80	360	10	20	50	120	290	<10	>20	4000	>310	70	460	40	100
		FC	<10	60	10	70	<10	<10	<10	<10	<10	<10	160	<10	<10	100	80	<10	340	60	95
		ENT	10	180	4	<2	36	20	4	<2	6	2	24	6	36	22	22	<2	20	2	4
BNB21	Abalone Avenue Beach	TC	10	>770	20	20	60	<10	10	40	20	170	10	20	<10	670	50	>270	>50	>260	10
		FC	20	<10	10	<10	<10	<10	<10	20	30	20	<10	<10	10	110	<10	<10	10	<10	<10
		ENT	34	4	4	2	6	2	<2	4	20	4	2	6	6	20	2	8	20	36	10
BNB01	Park Avenue Beach	TC	70	4800	10	20	50	<10	50	10	40	110	30	<10	20	6000	70	20	70	<10	10
		FC	<10	210	<10	<10	<10	<10	<10	<10	10	<10	<10	10	<10	95	10	<10	<10	<10	<10
		ENT	2	10	<2	<2	<2	2	<2	2	<2	8	2	<2	<2	34	10	<2	2	2	<2
BNB02	Onyx Avenue Beach	TC	180	>610	20	80	150	30	30	30	110	>240	<10	20	<10	5000	20	<10	>10	10	<10
		FC	10	10	<10	<10	10	<10	<10	<10	10	10	<10	20	<10	100	10	<10	10	<10	<10
		ENT	50	40	2	2	150	4	2	2	52	10	520	10	<2	34	10	2	20	<2	<2
BNB29	Promontory Point Channel	TC	40	<10	<10	<10	<10	10	<10	5800	<10	<10	60	<10	<10	800	10	10	>10	<10	<10
		FC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10
		ENT	<2	<2	<2	<2	<2	<2	<2	4	<2	<2	2	2	<2	8	<2	2	26	<2	2
BNB33	Bayside Drive Beach	TC	20	40	40	20	160	40	50	40	60	30	110	30	>80	730	>140	>50	>210	>100	NS
		FC	10	<10	20	<10	150	<10	<10	<10	<10	<10	40	20	<10	20	10	<10	50	10	NS
		ENT	10	8	10	6	10	2	10	2	36	4	10	32	10	<2	10	20	140	10	NS
BNB23	Rocky Point Beach	TC	>10	70	20	20	80	10	<10	10	10	280	70	20	<10	>790	30	10	60	380	10
		FC	<10	<10	<10	<10	10	<10	<10	<10	<10	20	<10	<10	<10	40	20	<10	<10	<10	<10
		ENT	<2	22	<2	2	8	<2	4	<2	2	44	4	2	2	190	6	6	2	68	2

Total Coliform (TC), Fecal Coliform (FC), Enteroc[illegible]s (ENT) Colony Forming Units / 100 ml Sample

TATION	Location Description		12/2/13	12/9/13	12/16/13	12/23/13	12/30/13	1/6/14	1/13/14	1/21/14	1/27/14	2/3/14	2/10/14	2/18/14	2/24/14	3/3/14	3/10/14	3/17/14	3/24/14	3/31/14	4/7/14
EWPORT BAY (Upper Bay)			RAIN	RAIN								RAIN				RAIN					
BNB24	Newport Dunes - Middle	TC	>340	40000	10	>170	30	20	95	30	>680	>330	100	30	720	4800	>40	>80	>110	10	4400
		FC	<10	960	10	20	<10	<10	40	30	30	240	<10	<10	150	180	20	10	80	<10	390
		ENT	4	244	2	56	<2	10	8	4	24	60	8	10	80	130	20	4	8	4	68
BNB24	Newport Dunes - West	TC	>320	>32200	30	3800	20	80	130	60	180	>390	20	30	580	9800	>150	80	>400	20	>390
		FC	10	1170	10	2800	10	<10	40	10	60	70	10	<10	270	150	40	10	360	<10	190
		ENT	2	327	10	36	8	8	20	4	28	246	58	8	84	130	20	6	10	6	110
BNB24	Newport Dunes - East	TC	250	>38000	2400	40	<10	80	40	<10	50	130	110	20	>80	>1210	>260	>220	>40	>30	NS
		FC	80	950	1480	<10	10	10	20	<10	10	<10	<10	10	30	70	170	80	10	10	NS
		ENT	22	140	26	20	20	20	20	20	6	98	10	4	24	160	38	32	10	6	NS
BNB24	Newport Dunes - North	TC	>320	40000	40	>140	50	70	50	30	60	30	60	40	>130	3400	>270	>20	>95	>60	10
		FC	20	1100	10	10	50	10	50	<10	10	10	20	70	<10	200	160	10	10	<10	20
		ENT	6	295	8	32	4	10	10	6	22	<2	8	24	10	30	32	4	10	6	48
BNB25	Vaughn's Launch	TC	300	>12000	30	NS	<10	NS	10	NS	NS	NS	40	NS	NS	NS	NS	20	NS	>30	NS
		FC	40	460	20	NS	30	NS	30	NS	NS	NS	10	NS	NS	NS	NS	<10	NS	10	NS
		ENT	80	>96	10	NS	10	NS	60	NS	NS	NS	38	NS	NS	NS	NS	10	NS	10	NS
BNB26	Ski Zone	TC	>170	NS	>130	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		FC	<10	NS	30	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		ENT	44	NS	150	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BNB28	North Star Beach	TC	>250	>40000	10	>80	110	20	30	<10	70	20	400	<10	20	6000	>420	>60	>70	60	>20
		FC	40	4800	<10	<10	20	<10	10	10	20	<10	260	<10	<10	70	40	<10	<10	10	<10
		ENT	8	1000	4	10	2	4	6	8	30	6	66	4	4	5000	90	56	8	22	2
BNB30	De Anza	TC	80	>22800	<10	60	20	10	10	10	30	80	<10	10	20	9600	60	10	20	<10	50
		FC	20	380	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	10	160	<10	<10	10	<10	<10
		ENT	<2	180	<2	4	<2	4	2	4	8	20	<2	<2	8	120	10	<2	<2	<2	2
BNB05	Bayshore Beach	TC	70	>18000	20	60	<10	<10	30	<10	10	100	20	10	20	7800	20	10	30	110	50
		FC	<10	210	10	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	140	<10	<10	<10	<10	10
		ENT	4	110	<2	2	<2	<2	<2	4	2	10	<2	4	2	94	10	2	8	4	2
EWPORT BAY TRIBUTARIES																					
CNBCD	San Diego Creek - Campus Dr.	TC	>4300	48000	>3000	>4900	>3400	>2200	>310	>340	>540	>300	>3800	>2600	>1800	>115000	>13000	>2600	>1100	>1800	>2600
		FC	240	6400	180	170	700	300	<10	<10	10	10	80	60	40	3000	>330	80	30	50	30
		ENT	44	7400	74	216	54	68	20	8	6	38	26	72	88	4600	293	68	64	64	46
CNBSA	Santa Ana Delhi Channel	TC	>7400	70000	>4500	>7800	>3800	>930	30000	>4900	>3000	>200000	7700	>2100	>2000	>72000	>5400	>770	>4800	>470	>26000
		FC	170	1180	60	210	280	80	7800	260	500	11000	120	220	40	>900	70	40	>200	140	170
		ENT	311	1000	180	251	228	76	226	190	170	27800	279	275	48	1000	600	44	170	46	170
CNBBC	Big Canyon Creek	TC	>720	>740	>420	>530	>290	>300	>640	>390	>470	>940	>480	>800	>420	NS	>380	>600	>250	>360	>3200
		FC	190	>700	<10	220	80	20	20	20	60	250	50	100	20	NS	80	80	10	10	10
		ENT	86	40	70	220	78	62	130	84	110	271	66	78	100	NS	180	100	92	56	150
CNBND	Backbay Drive Pipe	TC	>1230	>660	>960	>370	>510	>570	>1600	>1970	>3200	>740	>900	>11000	>5800	>410	>780	>5600	>7800	>5000	>3000
		FC	110	40	20	10	30	10	10	<10	40	180	30	50	120	40	10	40	190	300	210
		ENT	>200	283	80	110	96	76	150	110	1000	400	140	200	2600	234	74	190	600	232	86
EWPORT SLOUGH																					
BNS01	Lancaster Street &	TC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	>19000	NS
	61st Street	FC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	200	NS
		ENT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	86	NS
BNS02	Lancaster Street &	TC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	>10000	NS
	Canal Street	FC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<10	NS
		ENT	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	10	NS

OCSD Bacteriological C[illegible] Monitoring Program
Total Coliform (TC), [illegible]cal Coliform (FC),
Enterococcus (ENT) Colony Forming Units/100 ml Sample

DATE		12/3	12/4	12/10	12/11	12/17	12/18	12/26	12/27	12/30	12/31	1/7	1/8	1/14	1/15	1/21	1/22	1/28	1/29	2/4	2/5	2/10	2/13	2/18	2/19	2/25	2/26	3/4	3/5	3/11	3/12	3/18	3/19	3/25	3/26	4/1	4/2
Location/Tide																				RAIN	RAIN							RAIN	RAIN								RAIN	RAIN
Bolsa Chica	TC	17		<17		<17		17		270		<17		<17		<17		33		130		17		50		<17		270		<17		<17		<17		<17	
Beach	FC	<17		<17		<17		<17		170		<17		<17		<17		67		<17		<17		33		33		<17		17		<17		17		<17	
39N	ENT	2		2		<2		<2		6		<2		<2		4		8		<2		14		<2		4		8		<2		<2		2		2	
Bolsa Chica	TC	17		<17		17		17		<17		<17		<17		<17		33		17		50		<17		33		150		17		<17		33		<17	
Reserve	FC	<17		<17		<17		<17		17		<17		<17		<17		17		<17		33		<17		33		<17		<17		<17		<17		<17	
33N	ENT	8		4		<2		2		2		<2		4		4		34		2		8		2		8		18		2		<2		6		<2	
Bluffs	TC	17		<17		<17		<17		<17		<17		<17		<17		250		50		<17		17		17		83		33		17		33		<17	
27N	FC	<17		<17		<17		<17		<17		<17		<17		17		200		33		<17		<17		<17		<17		<17		<17		17		<17	
	ENT	4		20		<2		12		28		4		2		8		160		6		100		6		118		24		4		6		8		14	
17th Street	TC	33		<17		<17		<17		120		<17		<17		<17		83		<17		17		83		33		130		67		50		<17		<17	
21N	FC	67		<17		17		<17		50		<17		<17		<17		100		33		33		67		<17		33		50		<17		<17		<17	
	ENT	8		6		52		36		52		6		24		10		58		4		176		38		18		22		48		6		4		12	
Jacks Snack	TC	50		<17		17		<17		17		17		<17		<17		50		17		17		33		<17		50		17		<17		17		17	
Bar	FC	67		<17		<17		<17		50		50		<17		<17		17		33		17		17		<17		17		<17		<17		17		33	
15N	ENT	50		6		4		<2		12		26		12		4		32		4		124		6		6		16		4		4		8		4	
Beach Blvd.	TC	100		<17		17		<17		50		<17		<17		17		83		<17		<17		<17		17		200		<17		<17		17		120	
12N	FC	17		<17		<17		<17		17		17		<17		<17		33		17		17		17		33		17		<17		<17		17		120	
	ENT	40		2		2		<2		18		<2		2		2		56		6		94		6		10		10		14		4		14		16	
SCE Plant	TC	33	17	<17	180	120	17	<17	17	17	<17	17	<17	<17	<17	<17	<17	100	17	<17	<17	67	<17	<17	17	<17	180	17	33	<17	33	<17	<17	17	<17	180	67
9N	FC	33	17	<17	50	33	33	<17	17	33	<17	<17	<17	<17	<17	<17	<17	120	<17	<17	<17	83	<17	<17	83	<17	150	<17	<17	17	17	<17	<17	<17	33	230	50
	ENT	8	12	20	44	22	4	<2	2	14	12	<2	8	8	4	6	6	42	22	4	4	54	4	4	6	20	82	12	18	2	4	<2	38	12	22	2	2
Magnolia	TC	120	200	<17	<17	120	170	<17	<17	17	<17	67	<17	<17	<17	<17	17	33	67	<17	<17	17	<17	370	480	67	250	17	67	<17	33	<17	<17	17	380	83	33
Street	FC	120	120	<17	<17	100	170	<17	<17	17	<17	50	<17	<17	<17	17	17	50	17	17	17	83	<17	220	230	33	200	17	17	17	<17	<17	<17	<17	440	50	17
6N	ENT	94	54	<2	4	52	34	<2	2	10	30	10	<2	6	4	2	2	32	18	6	22	26	4	2	334	64	132	4	12	10	10	8	26	12	102	14	8
Brookhurst	TC	67	100	<17	<17	<17	17	17	33	67	620	33	33	<17	170	<17	<17	17	320	1000	300	130	1300	33	120	83	480	300	130	400	130	17	280	17	2000	1100	1000
3N	FC	17	17	<17	17	<17	<17	<17	50	50	420	50	33	<17	150	17	17	33	330	1100	250	100	1800	17	67	83	300	200	67	170	83	50	170	<17	1900	1200	1200
	ENT	18	36	<2	4	6	6	2	14	8	102	4	16	46	64	4	22	28	132	44	40	114	>400	102	48	72	192	60	8	54	110	26	26	2	216	>400	16
Santa Ana	TC	17	67	100	17	<17	17	<17	<17	180	33	<17	17	<17	<17	<17	380	120	120	350	150	100	33	17	83	17	<17	120	170	220	<17	2000	100	120	130	120	600
River Mouth	FC	<17	17	33	<17	17	<17	50	<17	50	17	<17	17	<17	<17	67	320	150	50	<17	33	67	33	50	50	33	<17	<17	17	130	17	1500	170	83	400	<100	400
0	ENT	16	28	6	16	2	<2	4	2	26	24	<2	22	14	14	2	16	124	36	18	16	52	60	6	20	10	4	34	36	38	6	>400	14	28	112	28	26
Orange	TC		50		<17		<17		<17		17		67		17		67		120		1100		17		50		<17		400		67		50		250		CWS
Street	FC		33		17		<17		17		17		50		17		<17		50		67		17		120		<17		17		<17		50		200		CWB
3S	ENT		32		<2		<2		4		8		22		6		12		90		26		10		48		4		34		24		40		104		110
52nd/53rd	TC		33		17		17		17		33		<17		33		17		50		200		17		33		<17		200		<17		17		100		CWS
Street	FC		17		17		<17		<17		33		<17		<17		<17		33		33		17		17		<17		<17		<17		<17		130		11000
6S	ENT		24		2		4		10		4		<2		22		8		12		24		20		2		6		84		14		14		58		10
38th Street	TC		17		<17		17		<17		<17		<17		<17		<17		33		17		17		<17		33		50		67		33		67		280
9S	FC		17		<17		<17		<17		<17		<17		17		<17		33		83		17		17		17		<17		17		<17		33		50
	ENT		2		<2		2		2		6		8		2		6		256		16		8		6		8		50		<2		6		20		8
15th/16th	TC		180		<17		<17		<17		<17		<17		<17		<17		440		<17		<17		17		<17		17		50		<17		17		17
Street	FC		200		<17		<17		<17		<17		<17		33		<17		500		<17		<17		<17		<17		17		33		<17		33		67
15S	ENT		18		2		4		4		2		2		<2		<2		118		2		6		6		<2		4		2		<2		14		2
Balboa Pier	TC		17		<17		33		50		<17		17		<17		<17		180		17		<17		<17		<17		33		33		<17		100		33
21S	FC		33		17		33		<17		<17		50		<17		<17		220		<17		<17		<17		<17		17		17		<17		17		17
	ENT		12		<2		6		<2		2		2		2		<2		108		8		2		<2		30		8		<2		<2		38		10
The Wedge	TC		<17		<17		33		<17		<17		<17		<17		<17		<17		<17		<17		<17		<17		17		<17		<17		33		<17
27S	FC		100		<17		17		<17		<17		<17		<17		<17		<17		17		<17		<17		<17		33		<17		<17		50		50
	ENT		14		<2		24		<2		<2		2		2		2		<2		2		<2		6		4		4		<2		6		32		6
Corona Del	TC		17		<17		<17		33		<17		2300		17		<17		100		33		<17		<17		150		17		<17		17		370		<17
Mar Beach	FC		<17		<17		17		<17		17		17		17		17		33		<17		<17		<17		83		<17		33		17		540		17
29S	ENT		6		<2		4		2		<2		2		<2		<2		26		4		6		<2		54		<2		14		8		44		2
Crystal Cove	TC		17		<17		1200		<17		<17		<17		<17		<17		17		<17		17		<17		<17		17		<17		<17		17		<17
39S	FC		33		<17		<17		<17		<17		<17		<17		<17		17		<17		<17		<17		<17		17		17		<17		<17		<17
	ENT		24		<2		2		2		<2		2		<2		<2		6		<2		2		<2		2		2		2		<2		<2		<2

SPRING TIDES

NEW DATA

SINGLE SAMPLE STANDARD VIOLATION

N/S NO SAMPLE / NO DATA

CWOS CONFULENT GROWTH WITHOUT SHEEN

CWS CONFULENT GROWTH WITH SHEEN

CWB CONFULENT GROWTH WITH BLUE (FECAL INDICATOR)

City of Newport Beach
Water Quality / Coastal Tidelands
Committee

March 13, 2014

2014 Goal Setting

1. Street Sweeping and Catch Basin Cleaning
2. Trash Booms in the Newport Bay Watershed
3. Storm Drain to Sewer Diversions – i.e. the "Arches"
4. Marine Protected Areas (MPAs) and Areas of Special Biological Significance (ASBSs) – dry weather flows and related issues
5. Newport Bay Total Maximum Daily Loads (TMDLs)
6. Refuse and Household Hazardous Waste Pickup
7. Grey Water Standards

8. Biofilm Research

9. Semeniuk Slough

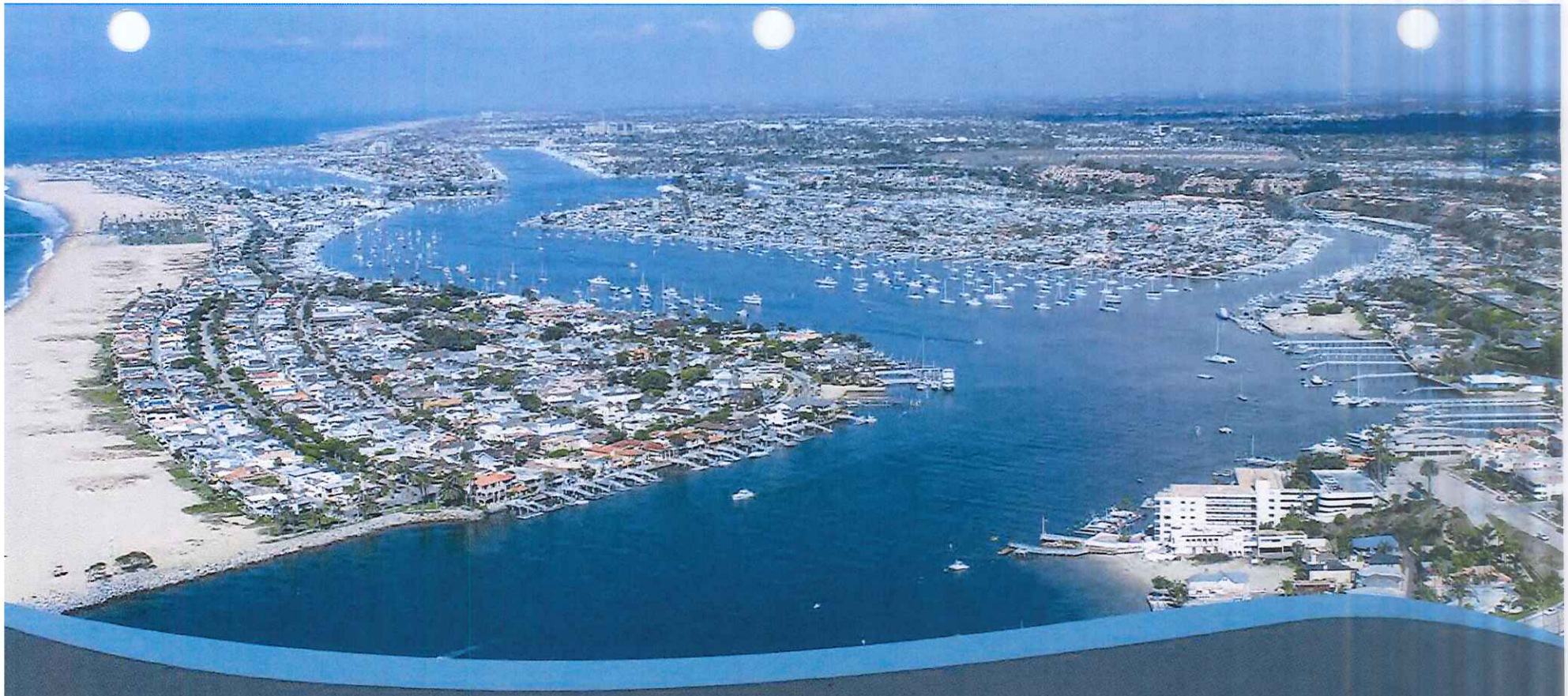
10. Bight '13

11. Banning Ranch

12. Reclaimed Water

13. Habitat Restoration

Note: Projects are not listed in any specific order.



Copper Total Maximum Daily Loads:
What are they and how can they impact Newport Bay?

Presented by
Shelly Anghera, Ph.D.

April 10, 2014

Presentation Outline

- What is a TMDL?
- What is copper TMDL?
- What is going on in Newport Bay?
  - What do we know?
  - What don't we know?
- What can the Newport Bay community do to address the copper TMDL?

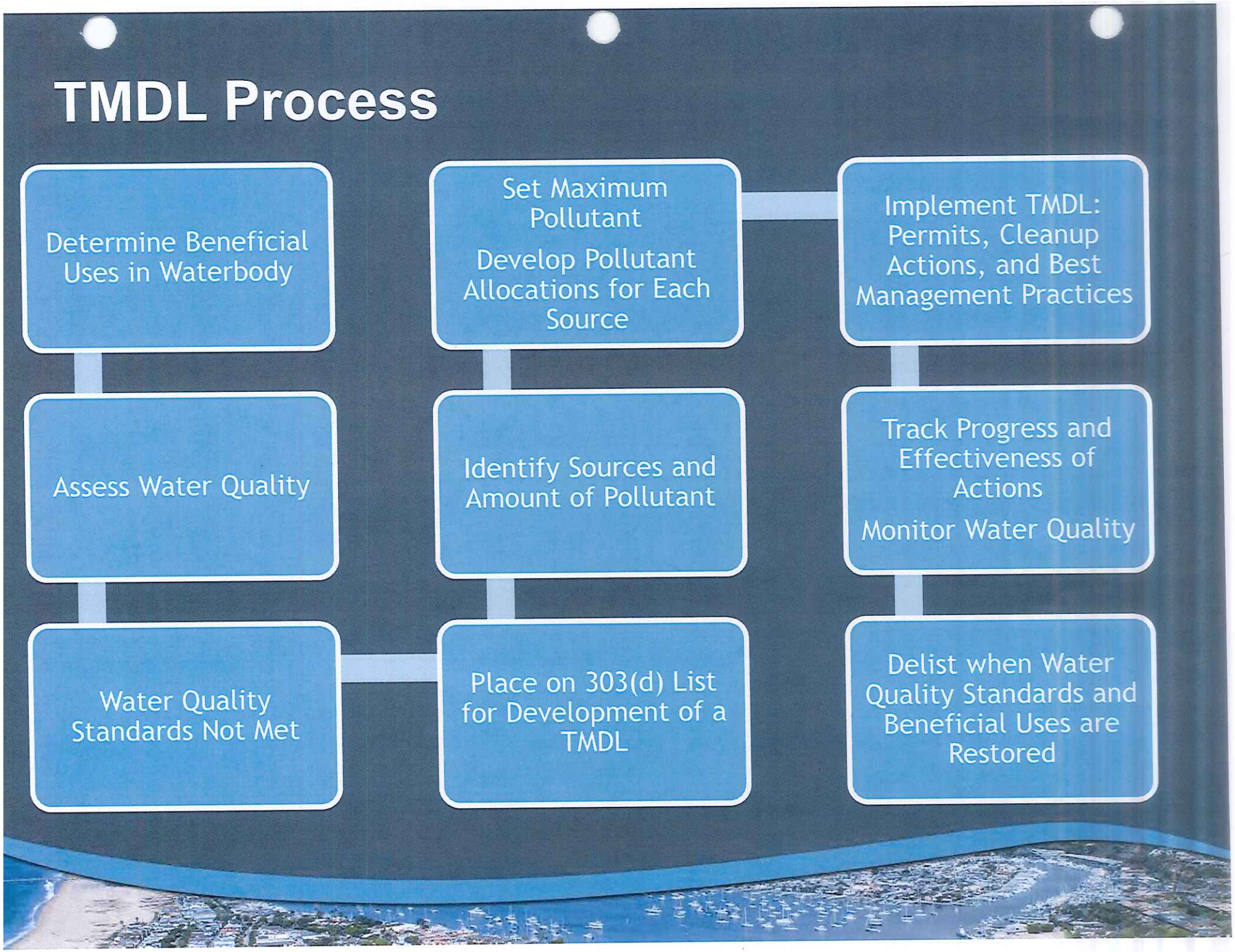
What is a TMDL?

- A regulatory term in the Clean Water Act that describes the maximum amount of a pollutant that a body of water can receive and still meet water quality standards

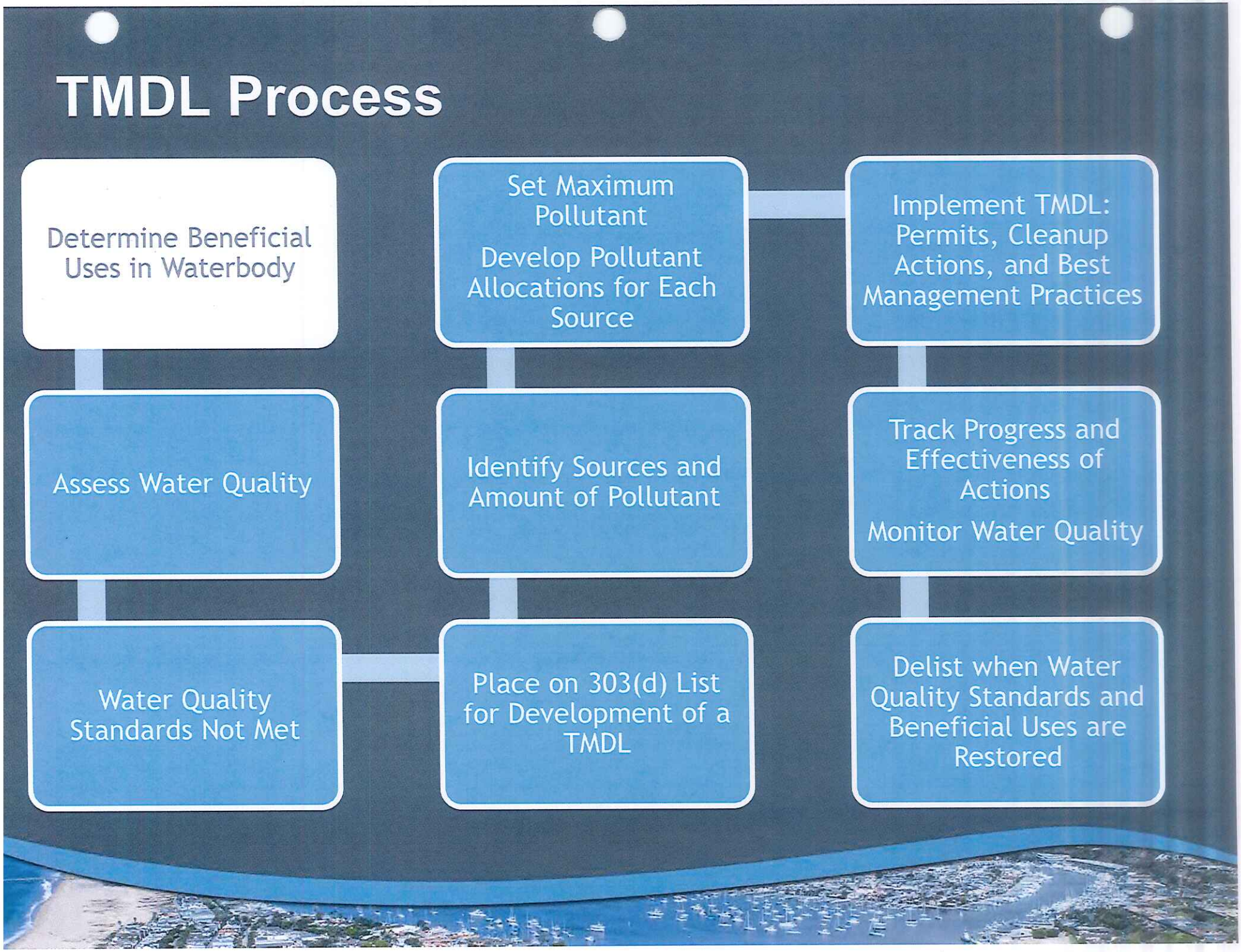
Why do we have TMDLs?

- Clean Water Act
  - "Restore and maintain the chemical, physical, and biological integrity of the Nation's waters"
  - Requires States to list impaired waters and develop TMDLs for priority ranked waters
  - Requires States to develop TMDLs for pollutants in waters where pollution controls are required to meet water quality standards

TMDL Process



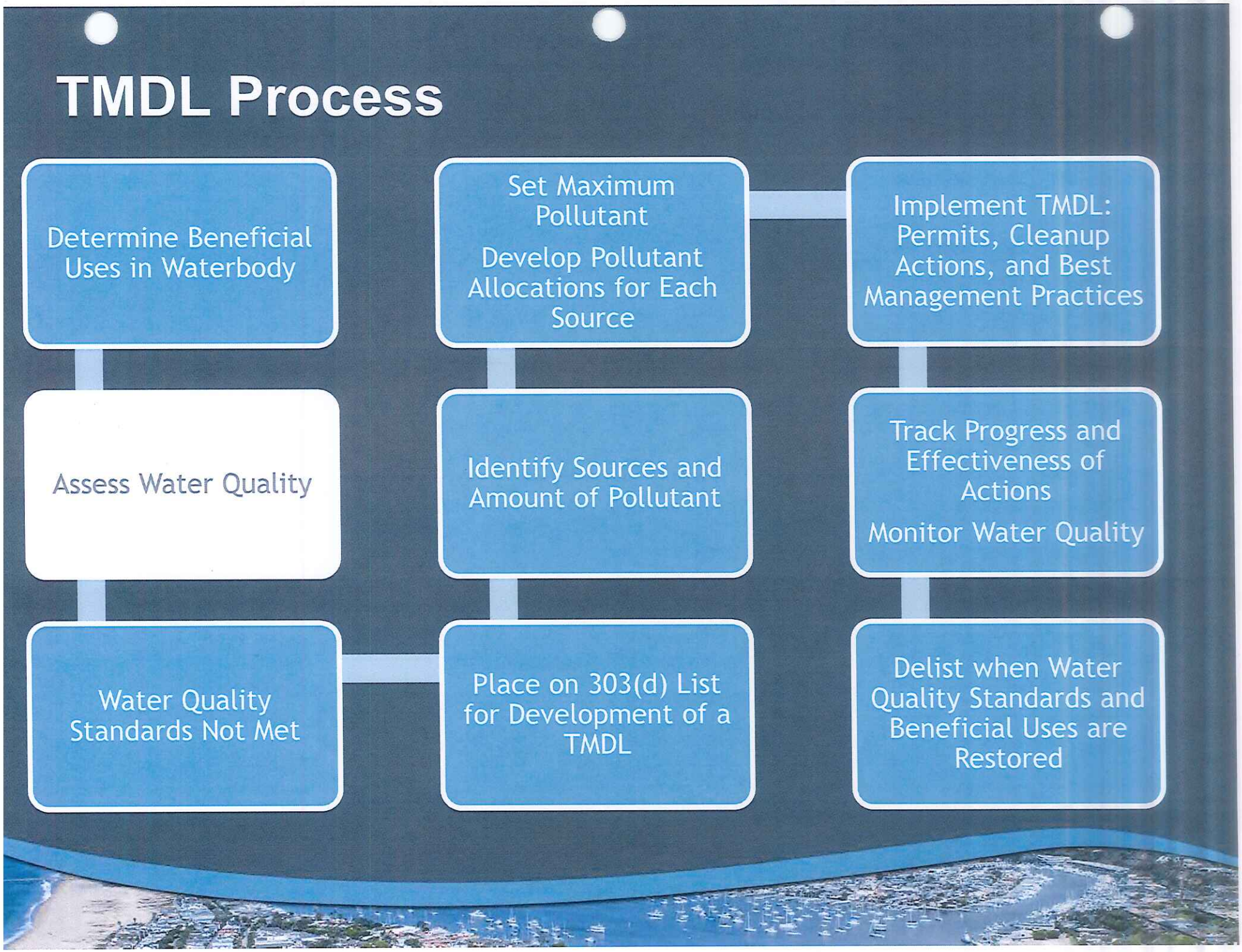
TMDL Process



Designated Beneficial Uses Within Harbors

- Navigation
- Industrial service supply
- Recreational use water contact
- Non-contact water recreation
- Commercial and sport fishing
- Protection of aquatic life, including marine
- Rare and endangered species and habitat
- Areas for spawning and reproduction
- Wildlife habitat
- Shellfish harvesting

TMDL Process



Data Collection Programs

- Permit compliance
- Proposed dredged material characterization
- Regional monitoring programs
- Special studies

Water Quality Criteria

- Narrative criteria
  - "Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."
- Numeric criteria
  - "The ambient water quality criterion for copper is 3.1 µg/L for the protection of marine aquatic organisms"

Example Issue: Copper TMDLs Use Conservative Numeric Targets

Most Sensitive Marine Organisms

- Sea urchin
- Summer flounder
- Oyster
- Mussel

Criterion Maximum Conc. 4.8 µg/L

Criterion Continuous Conc. 3.1 µg/L

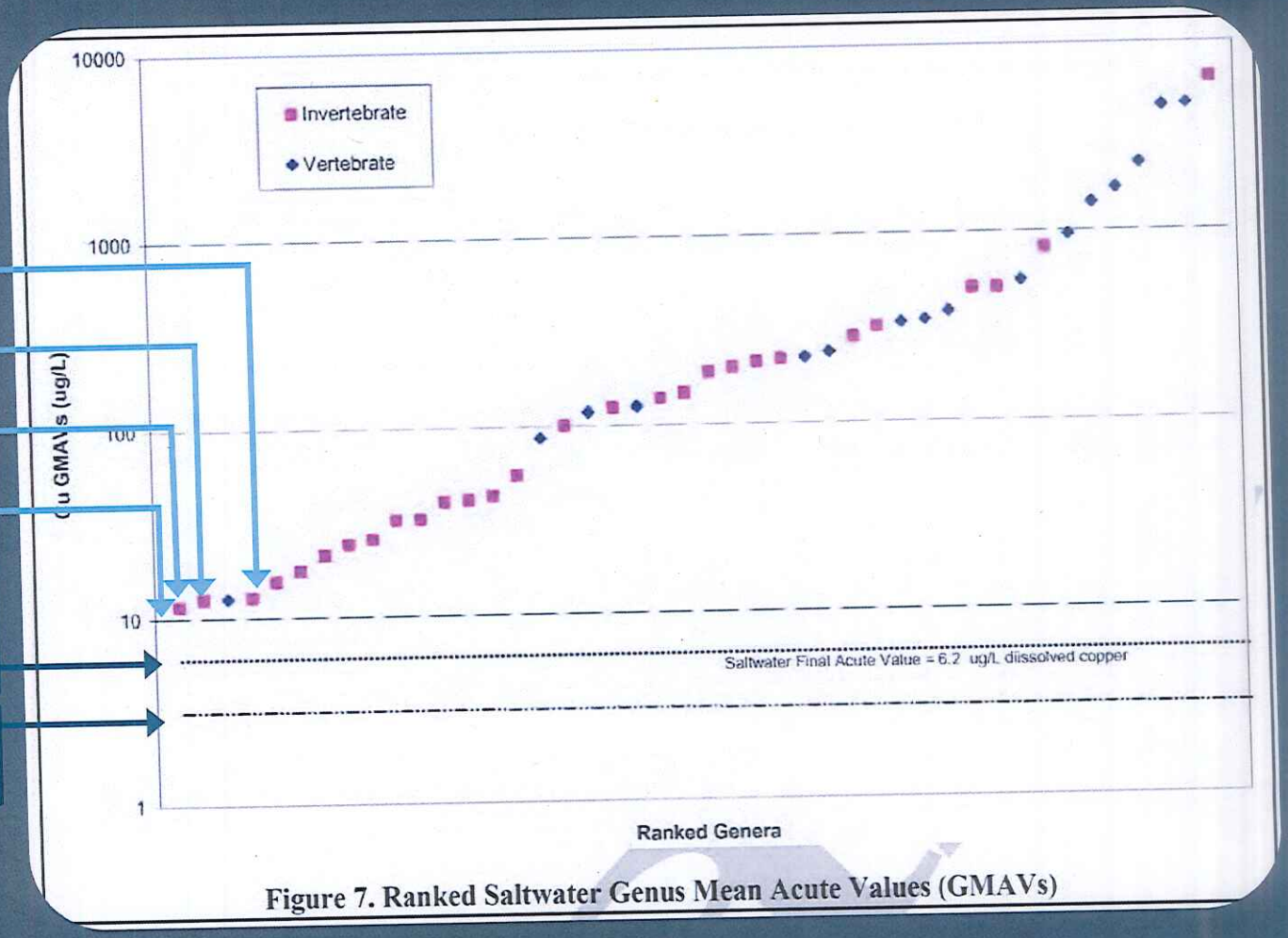
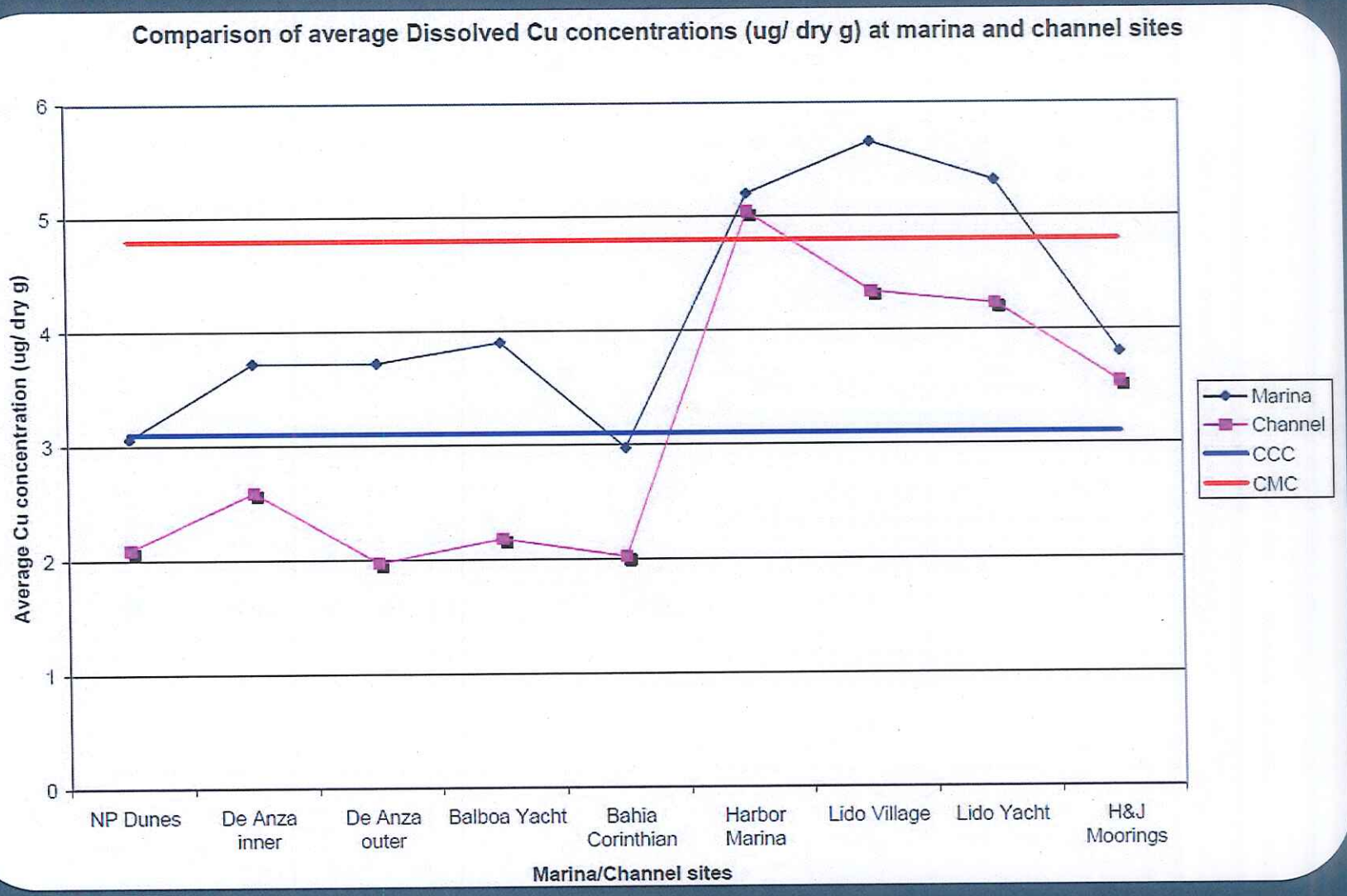


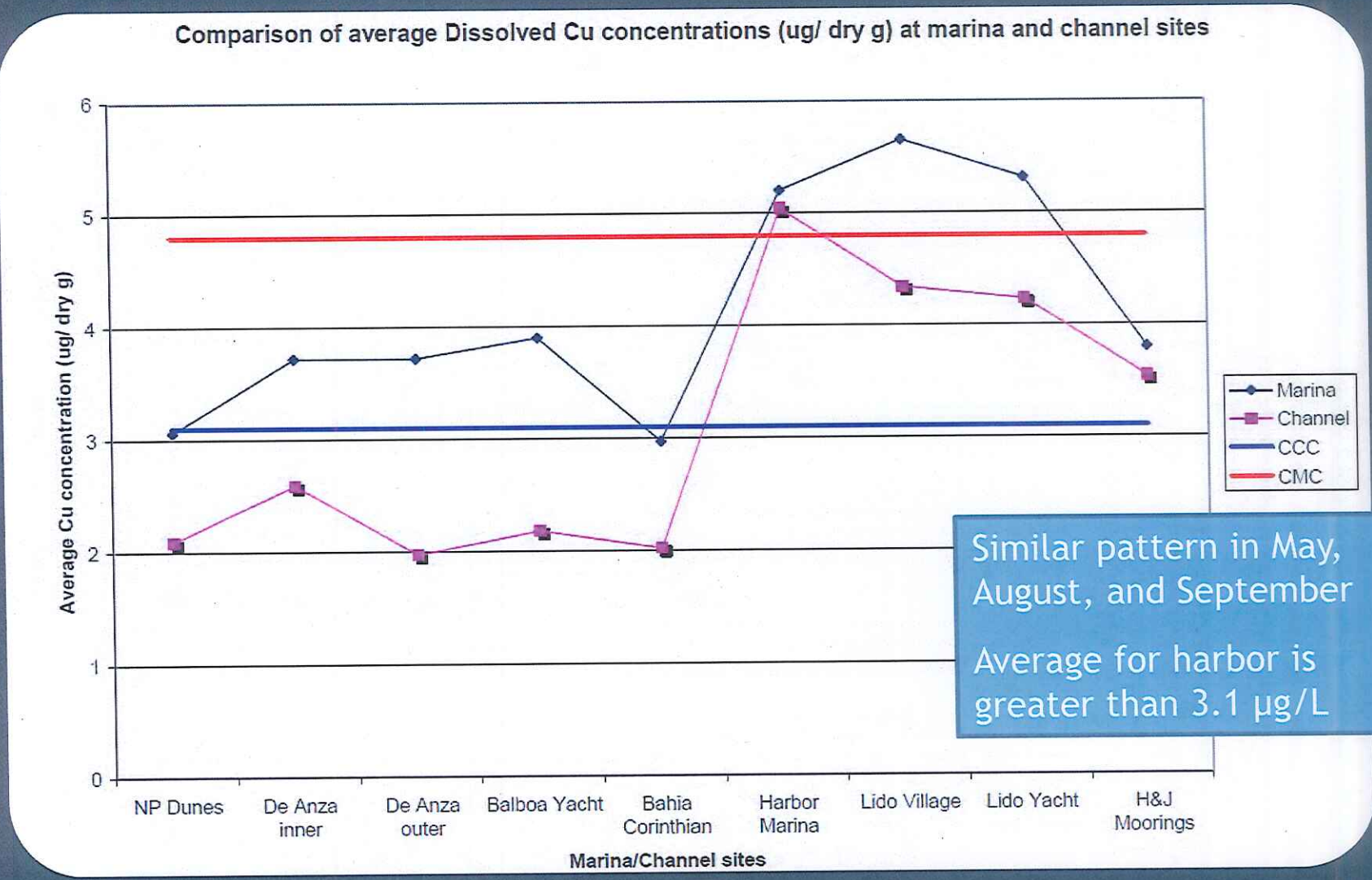
Figure 7. Ranked Saltwater Genus Mean Acute Values (GMAVs)

Data suggest that development of site specific objectives in accordance with USEPA (1994) may be appropriate.

Orange County Coastkeeper 2007



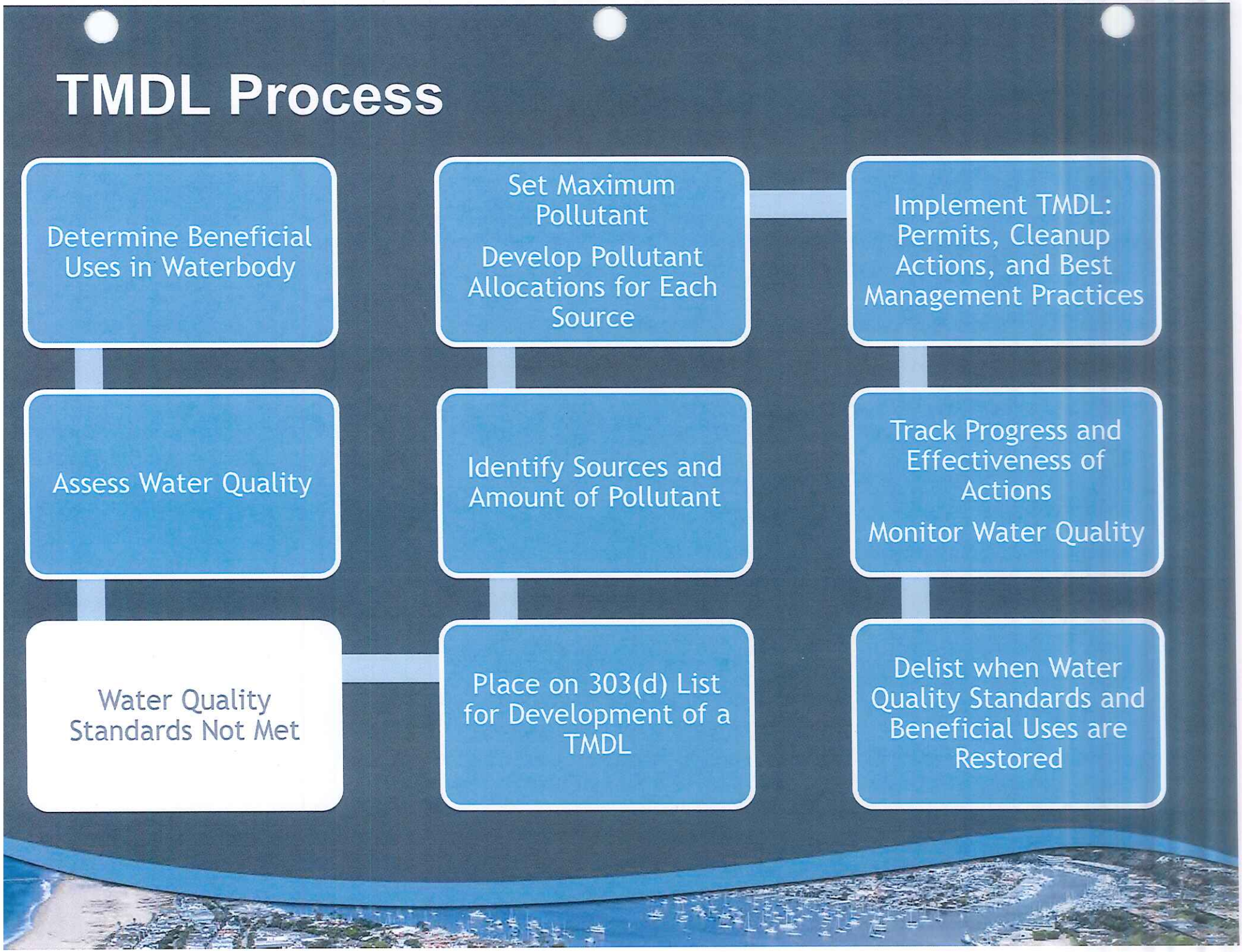
Orange County Coastkeeper 2007



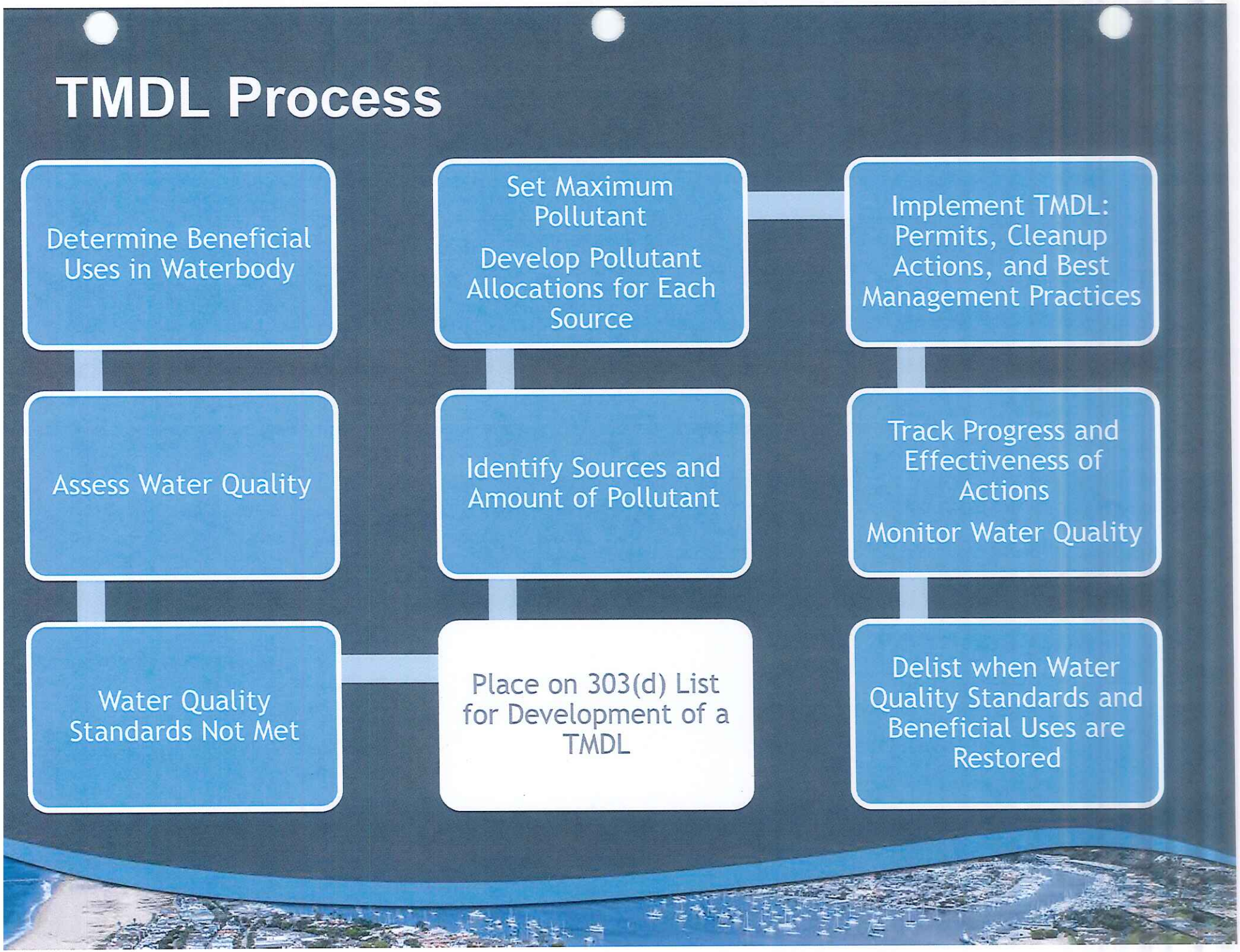
Similar pattern in May, August, and September

Average for harbor is greater than 3.1 µg/L

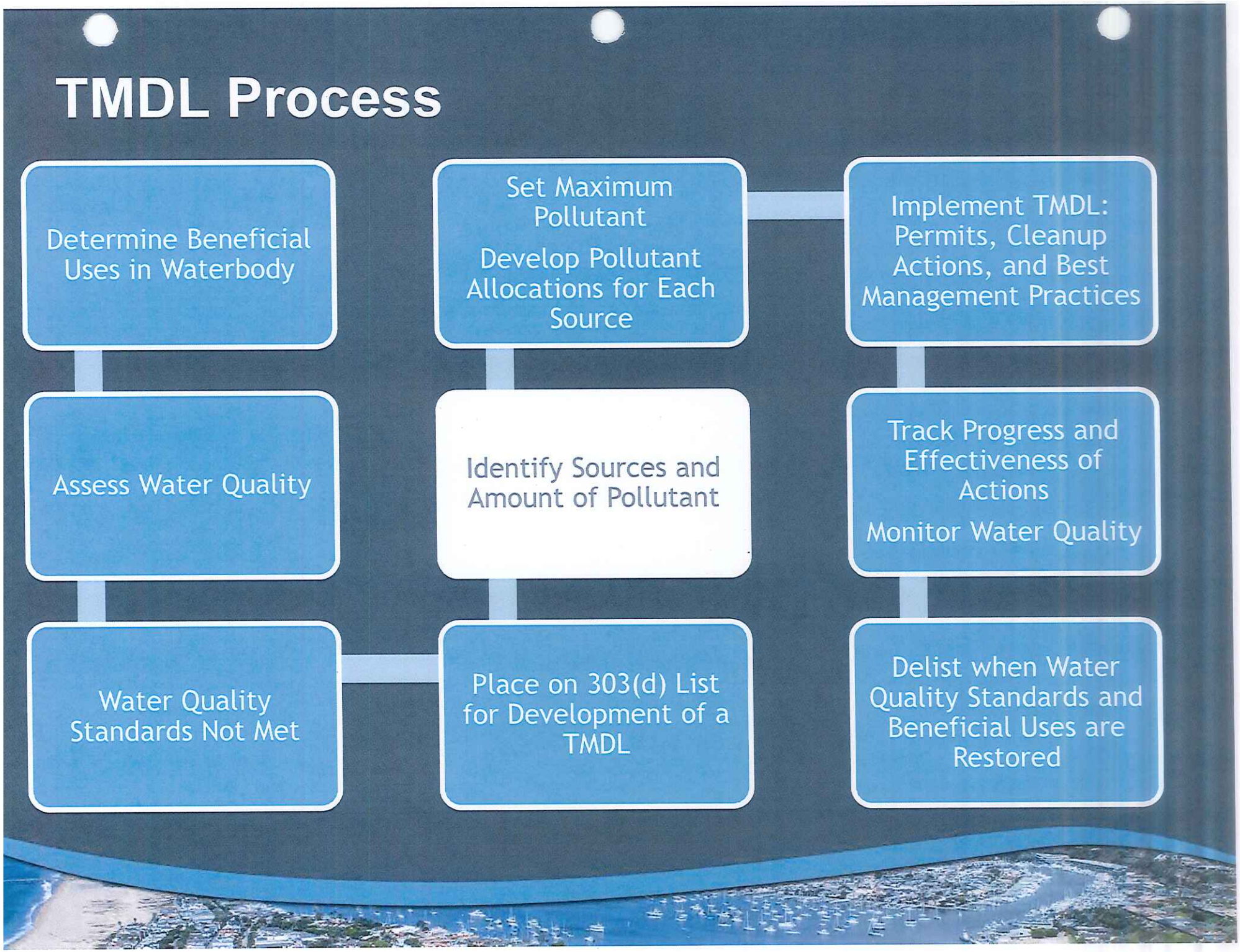
TMDL Process



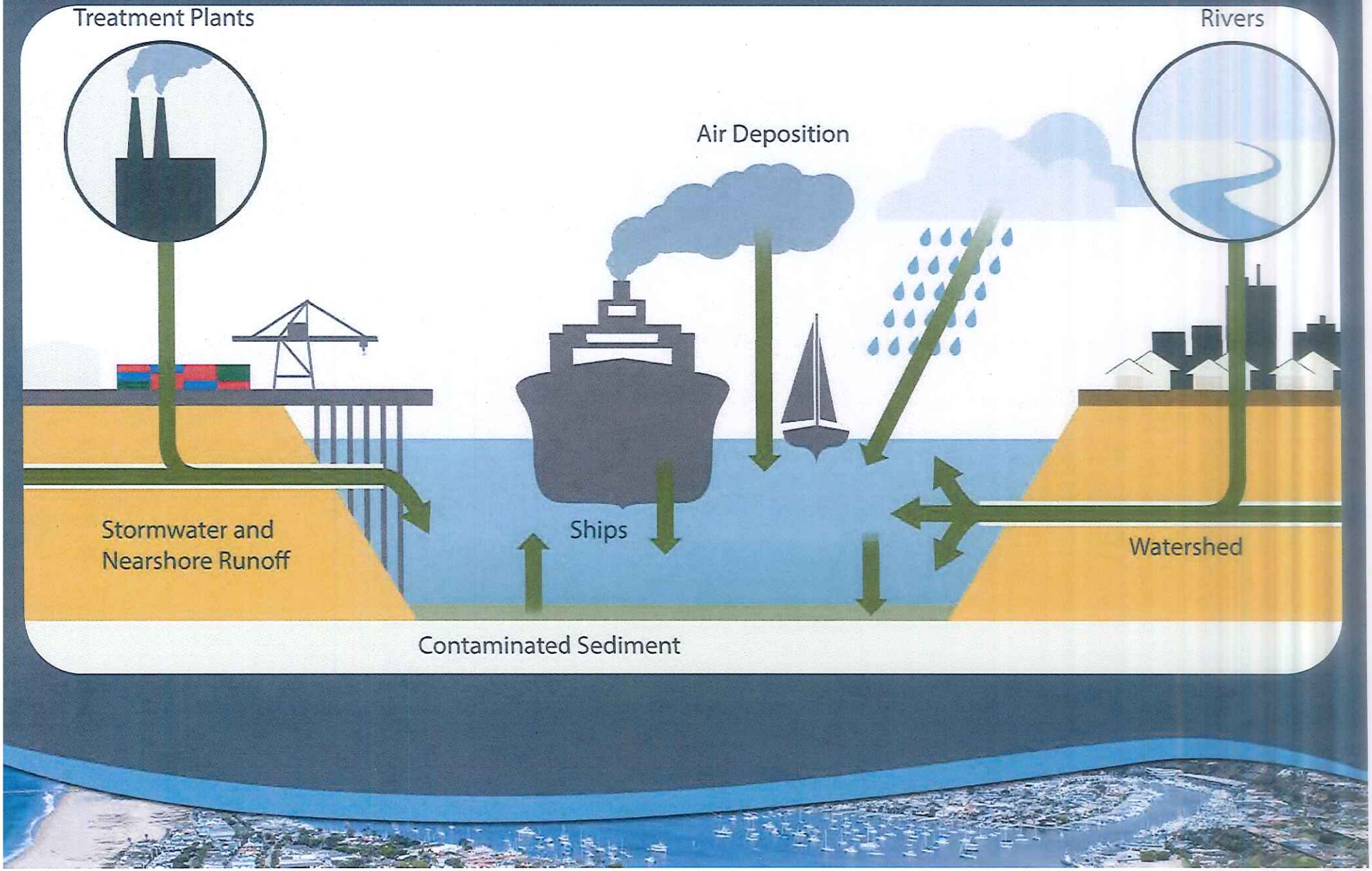
TMDL Process



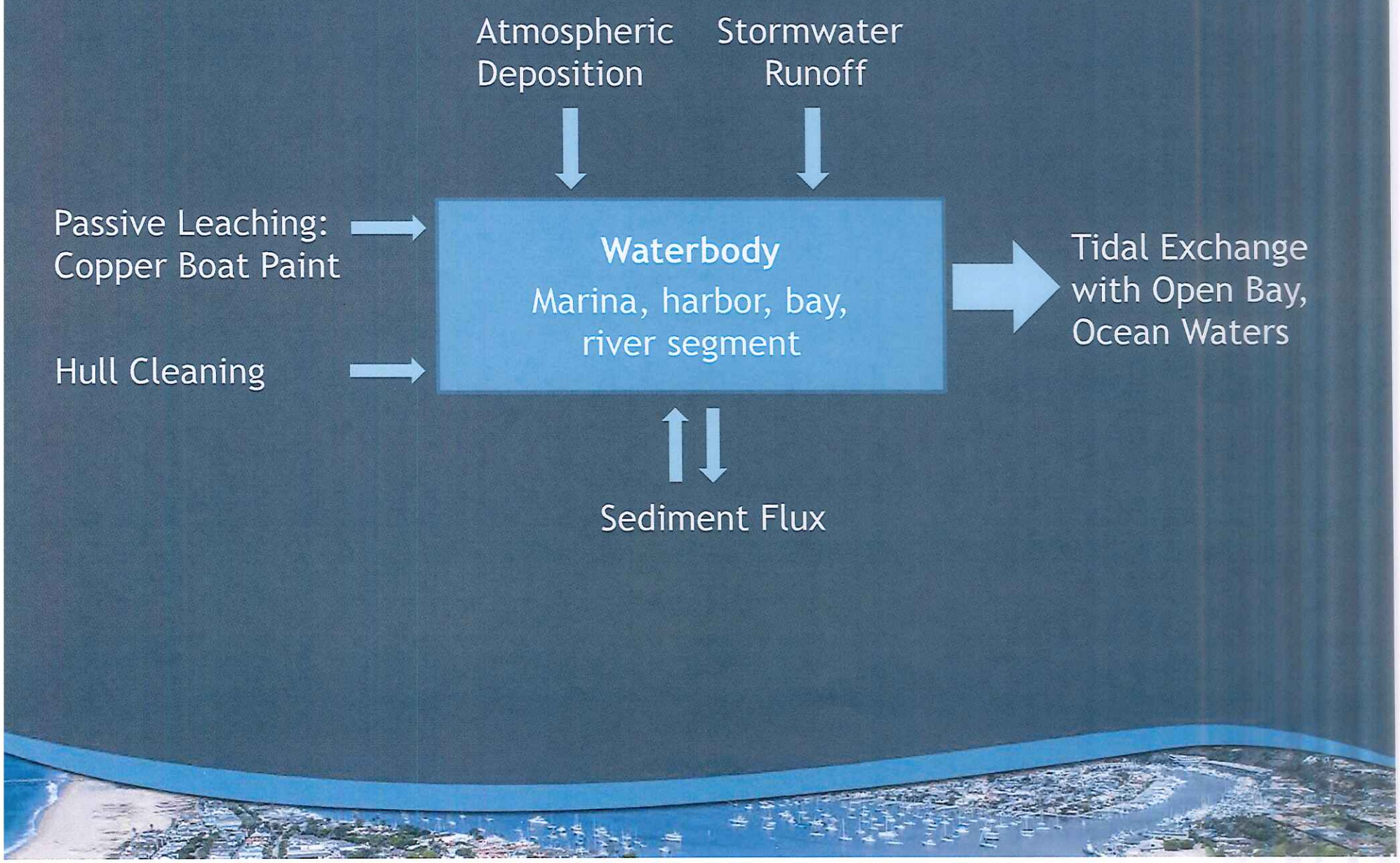
TMDL Process



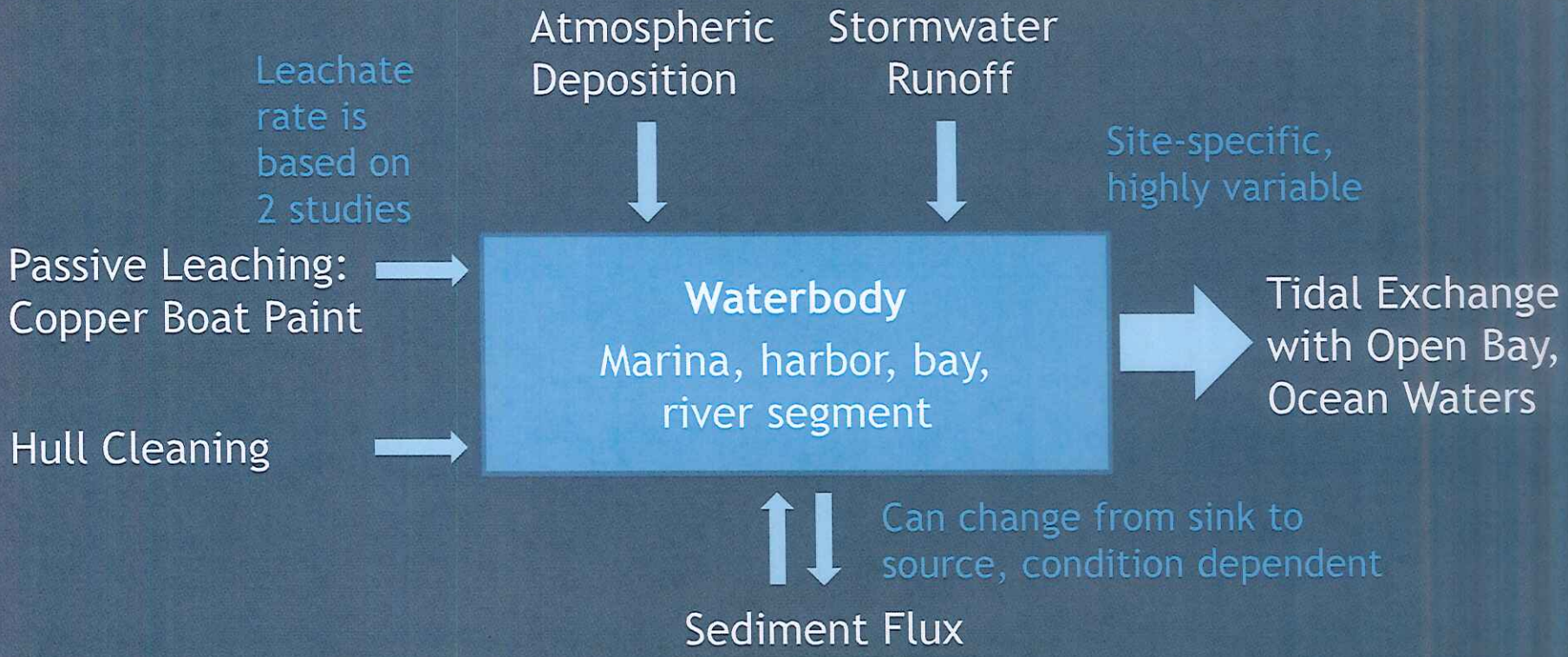
Potential Sources of Pollutants



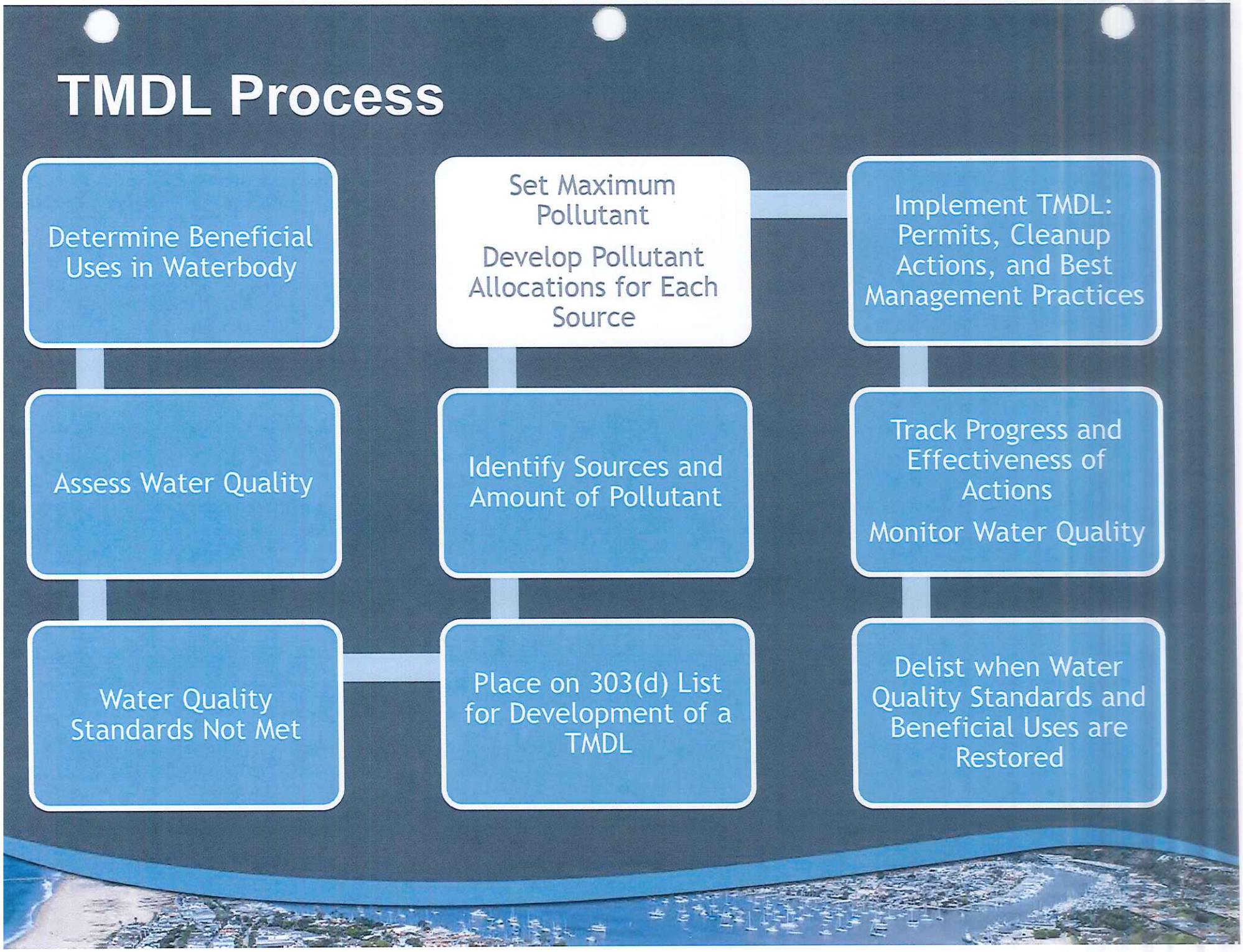
Example Issue: Copper TMDLs Assumed Sources and Sinks



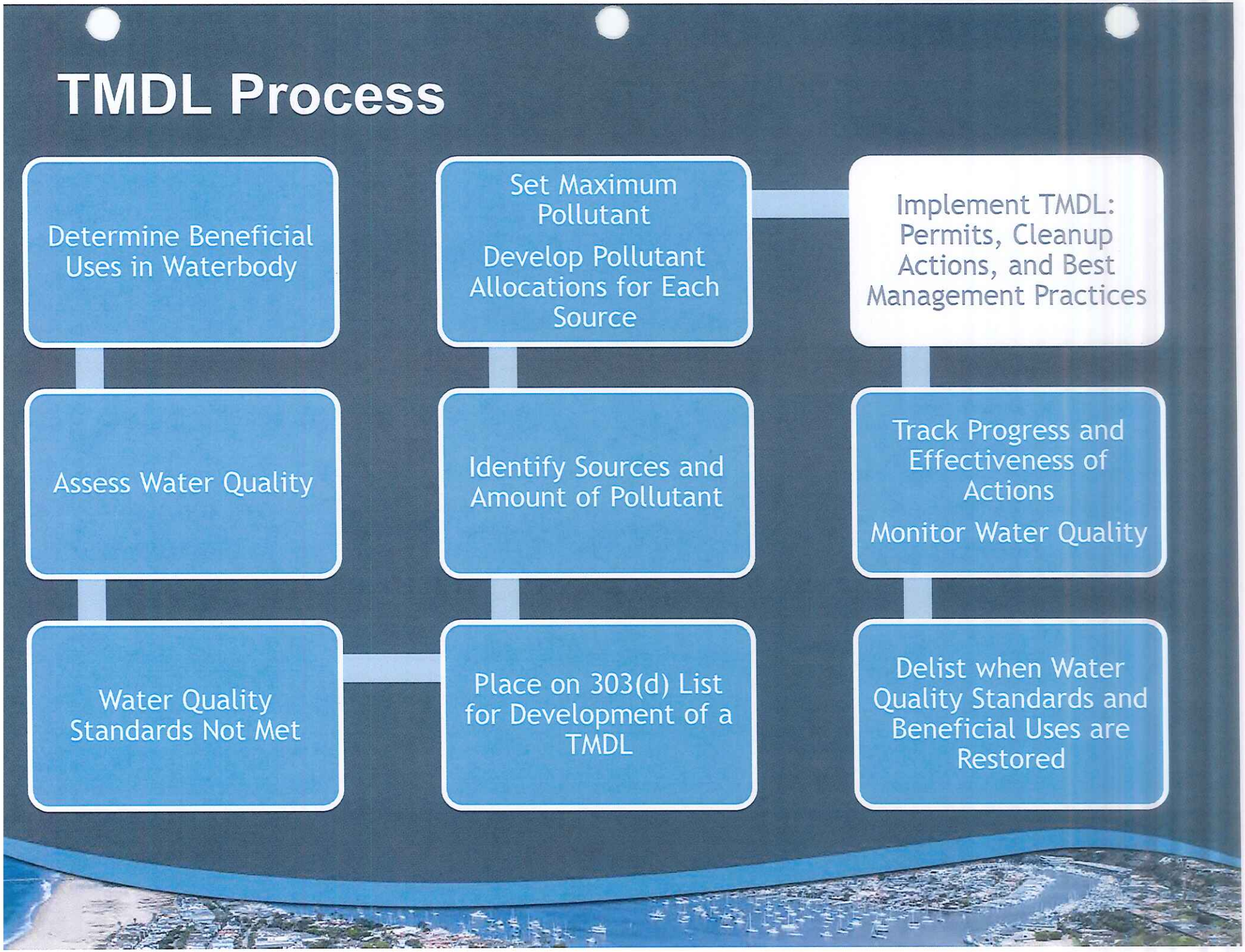
Example Issue: Copper TMDLs Assumed Sources and Sinks



TMDL Process



TMDL Process



What is going on in Newport Bay?

- What do we know?
  - Data show copper >3.1 frequently enough that RWQCB believes copper controls are needed
- What don't we know?
  - Is 3.1 µg/L overprotective? Does Newport Bay really have a water quality problem?
  - Is the marine life impacted? Is toxicity observed?
    - Anchor QEA (4 tests) – none observed;
    - Orange County Coast Keeper (10 tests in 2007) – none observed
  - What methods are going to be effective at reducing Cu in Newport?

Meeting TMDLs: Non-Voluntary Actions

- Reduce copper boat paint
- Implement monitoring program
- Permit compliance requirements
  - WDRs, NPDES, MS4, industrial, and construction permits
- Support Dept. Pesticide Regulation antifouling paint (AFP) limit of 9.5µg/L

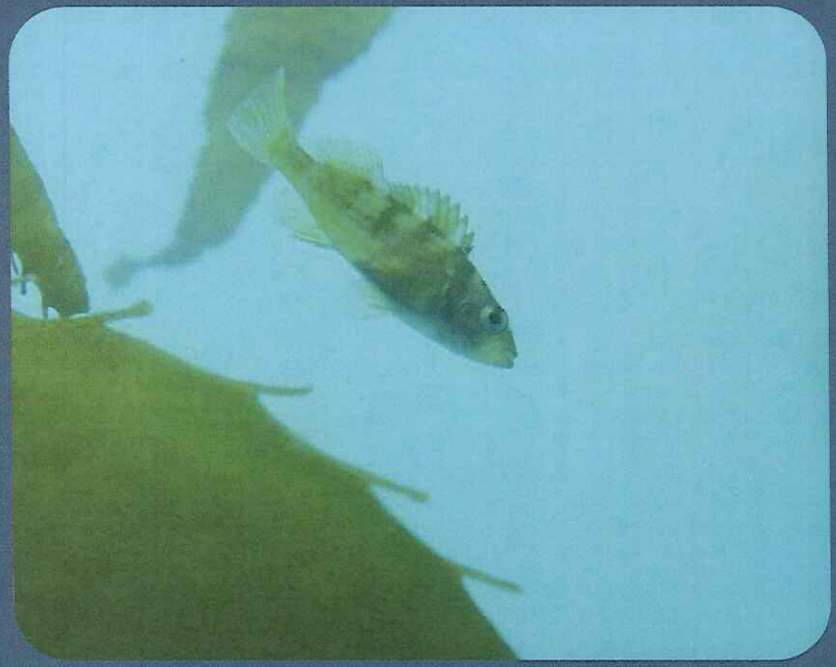
Meeting TMDLs: Voluntary actions

- Develop site-specific copper criteria
- Public education
- Implement best management practices

Recommended next steps

1. Find out what the Implementation plan will say and how RWQCB will enforce the copper limits
2. Develop monitoring plan with RWQCB acceptance
3. Determine the average copper concentration in the harbor. Determine where copper may be elevated.
4. Evaluate the effectiveness of developing a new water quality criteria for Newport Bay
5. Continue to implement BMPs and public education/out reach
6. Develop regional approaches through CMANC and other boating organizations

Questions



Proceedings of Coastal Zone 07
Portland, Oregon
July 22 to 26, 2007

BALANCING RECREATIONAL BOATING, INVASIVE SPECIES PREVENTION, AND WATER QUALITY PROTECTION

Jamie A. Gonzalez, University of California Cooperative Extension-Sea Grant Extension Program, San Diego County
Leigh T. Johnson, University of California Cooperative Extension-Sea Grant Extension Program, San Diego County

Keywords: recreational boats, invasive species, water quality, hull transport, antifouling paint

INTRODUCTION

California's boating industry contributes $16 billion per year to the state's economy (CSU, Sacramento Foundation 2002). Impacts from invasive species introductions and from toxic antifouling bottom paints continue to affect California's ecosystem. The University of California Cooperative Extension- Sea Grant Extension Program in San Diego has been working on cost-effective programs for boaters to prevent hull transport of aquatic invasive species (AIS) and to protect water quality by reducing the use of toxic antifoulants.

BACKGROUND

Antifouling paints are under regulatory scrutiny in California due to elevated levels of dissolved copper in crowded boat basins. Total Maximum Daily Load programs to regulate copper from antifouling paints are complete or are underway in a few, southern California coastal areas. The California State Water Resources Control Board will require 76% reduction of copper discharges from antifouling paints in Shelter Island Yacht Basin of San Diego Bay by 2022 (CRWQCB, SDR 2004). Other parts of San Diego Bay have been listed on the California SWRCB 303(d) list of impaired water bodies for dissolved copper (CSWRCB 2006) and actions in other southern California boat basins suggest copper antifouling paints may soon be restricted elsewhere in the region (CRWQCB, LAR 2005; USEPA 2002). State and national action may further restrict copper-based antifouling paints. California Department of Pesticide Regulation and United States Environmental Protection Agency (USEPA) (Singhasemanon 2005) are reevaluating antifouling paints and USEPA is considering lowering the standard for dissolved copper in saltwater from 3.1 µg/l to 1.9 µg/l (USEPA 2003). Some scientists and regulators fear that antifouling paint restrictions may increase the risk that aquatic invasive species (AIS) will be carried on vessel hulls.

The entire California coast has experienced invasions by species not native to the state or to the area of the coast where they have been discovered. Invasive species threaten biological diversity and ecological integrity worldwide. They can permanently reduce biodiversity by preying on, parasitizing, out-competing, causing or carrying diseases, or altering habitats of native species. (Convention on Biological Diversity 2005) Some AIS cause or carry human diseases or foster other species that do (Brancato and MacLellan 1999). Hull-borne invasive species can cause severe economic and ecological damage.

Some can damage shorelines, man-made marine structures, equipment, and vessels, requiring costly repair or replacement. For example, the Atlantic shipworm (*Teredo navalis*) introduced by hull fouling, caused between $2 billion and $20 billion worth of damage to maritime facilities in San Francisco Bay in the early 20th century. (Cohen 2004)

WATER QUALITY AND INVASIVE SPECIES

The potential statewide ban of copper-based antifouling paints in California may exacerbate invasions as the toxicity of vessel hulls declines and water quality improves in coastal ports and harbors. On the other hand, native species may be more resistant to invasions if water quality improves. Although antifouling paints contribute to fouling control, recent studies indicate that hull fouling is still an important vector for invasive species. (Rainer 1995; Coutts 1999; Hewitt et al. 1999; Hewitt and Campbell 2001) In part this is because toxic antifouling paints simply slow fouling growth; they do not prevent it from becoming established on vessel hulls. Periodic, mechanical, hull cleaning is needed even when antifouling paints are present (Johnson and Miller 2002). Additionally, despite the biocidal action of antifouling paints, some species have evolved resistance to copper-based antifouling paints (Hall 1981). Resistance to heavy metals is a potentially important trait for introduced marine organisms, facilitating their successful invasion into disturbed natural communities (Piola and Johnston 2005).

RECOMMENDATIONS

The Hazard Analysis and Critical Control Point (HACCP) approach is becoming the standard for aquatic invasive species management. HACCP principles include identifying critical control points (CCPs), establishing controls for each CCP and establishing CCP monitoring requirements (AIS-HACCP 2004).

The CCPs are the points where removing fouling growth from hulls and underwater running gear and where using antifouling paints will be most effective in preventing or controlling invasive species transport. Focusing efforts on these CCPs helps to reduce costs and avoid unnecessary inconvenience. This approach begins by identifying vessels and situations that pose a higher risk of transporting and introducing hull-borne invasive species, taking into account those that pose a higher risk of contributing to elevated metal levels from antifouling paints in boat basins. Boat owners, marina managers, resource managers, scientists and others can help to develop this information. They can use it to decide how and when to deploy antifoulants, hull cleaning and other practices, to design research to improve practices, and to design long-term solutions.

The HACCP approach has been considered in developing the following recommendations for preventing the hull transport of AIS while protecting water quality. These practices are enhancements of existing, hull-husbandry practices and thus should be reasonably easy to adopt:

- Clean the hull before leaving the home harbor to travel to a distant region, island or to an event with boats from other areas.

- Boat owners, who have left their home region or visited a major port, should clean hulls before traveling to a new destination or returning home.
- Upon arrival from a distant region or major port, heavily fouled boats should be hauled for hull cleaning.
- Removed material should be contained and disposed to prevent release to local ecosystems.

Some additional recommendations take into account boater trip distances. Boats that do not travel long distances are less likely to encounter potentially invasive species. Thus, the most reduction in pollution with a low risk of AIS transport could be achieved if such boats used nontoxic hull coatings with companion strategies, such as slip liners or frequent, in-water hull cleaning. Boats that travel long distances are most likely to acquire and transport invasive species. These boats may be better candidates for copper-based or less toxic antifoulants, as opposed to nontoxic hull coatings. Because they are relatively few in number and spend more time at sea, they would discharge relatively less toxicant to confined, marina waters.

By following the recommendations based on their own situations that may pose risks of transporting AIS or contributing to water quality degradation, boaters can adapt the HACCP approach and take matters into their own hands to protect water quality and prevent the hull transport of invasive species.

The University of California Cooperative Extension-Sea Grant Extension Program of San Diego County continues to conduct outreach programs on these recommendations for the boating communities of California and Baja California.

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Water Quality / Coastal Tidelands Committee
April 10th, 2014

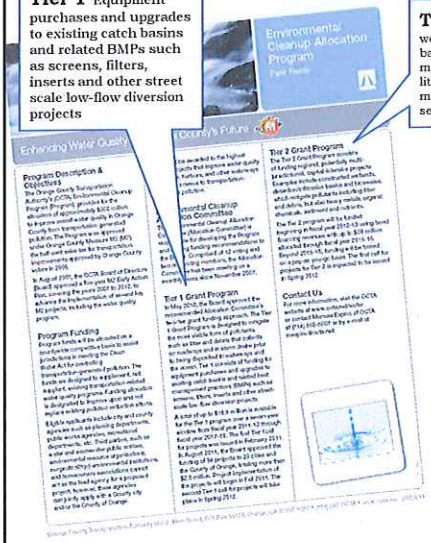
Orange County Transportation Authority (OCTA)
Environmental Allocation Cleanup Program

Presented by: John Kappeler
Public Works

Program Fact Sheet

Tier 1 Equipment purchases and upgrades to existing catch basins and related BMPs such as screens, filters, inserts and other street scale low-flow diversion projects

Tier 2 Constructed wetlands, detention/infiltration basins and bioswales, which mitigate pollutants including litter and debris, but also heavy metals, organic chemicals, sediment and nutrients.



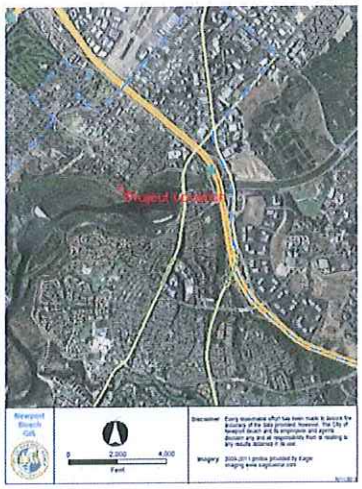
Fast Facts

- OCTA Measure M – half cent sales tax for transportation approved by voters in 2006
- $300M to improve overall water quality in OC from transportation generated pollution
- Grant Program – countywide competitive basis

Tier II Program

- $25.3M available FY 2013-14
- $5M per grant application
- 20-50% matching funds

Tier II Projects – Awarded
Bayview Heights Restoration/Mitigation Project



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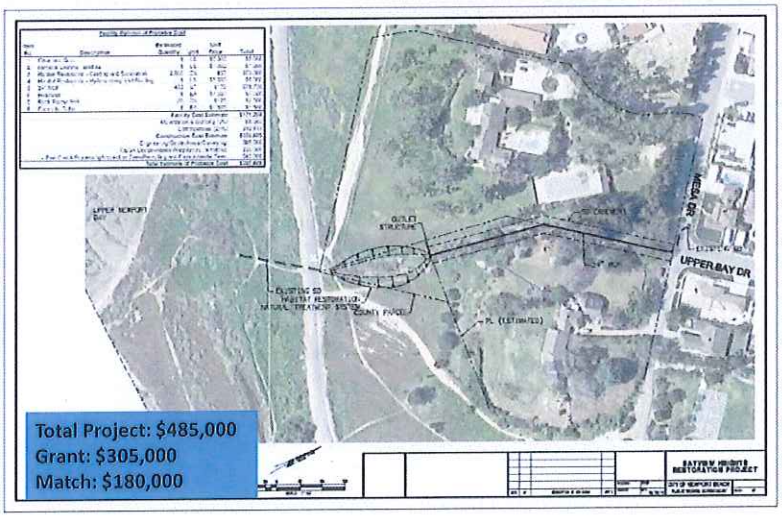
Tier II Projects – Awarded
Bayview Heights Restoration/Mitigation Project

5

Tier II Projects – Awarded
Bayview Heights Restoration/Mitigation Project



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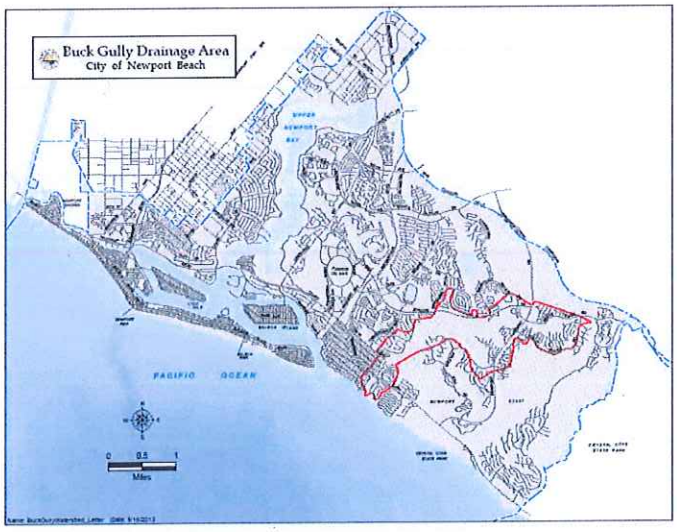
Tier II Projects – Awarded
Bayview Heights Restoration/Mitigation Project




Tier II Projects – Awarded
CdM Water Quality Improvement Project



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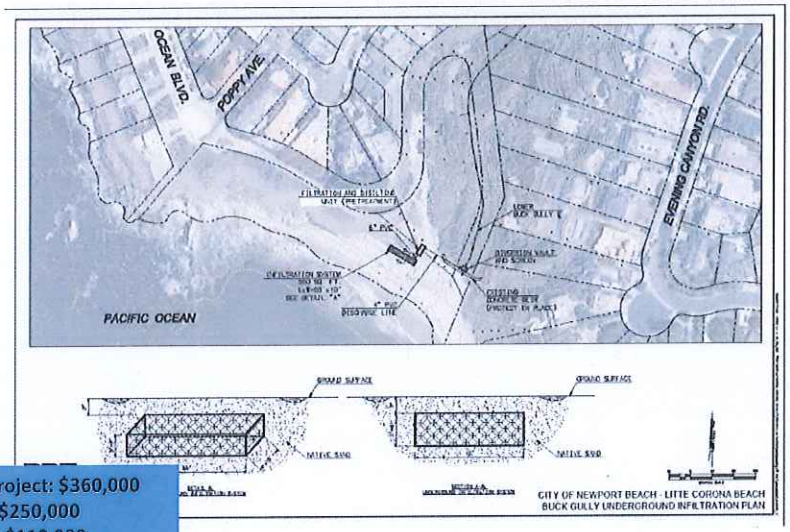
Tier II Projects – Awarded
CdM Water Quality Improvement Project



Total Project: $360,000
Grant: $250,000
Match: $110,000

9

Tier II Projects – Awarded
CdM Water Quality Improvement Project

10

Tier II Projects – Awarded
Big Canyon Restoration/Wetlands Project

11

Tier II Projects – Awarded
Big Canyon Restoration/Wetlands Project

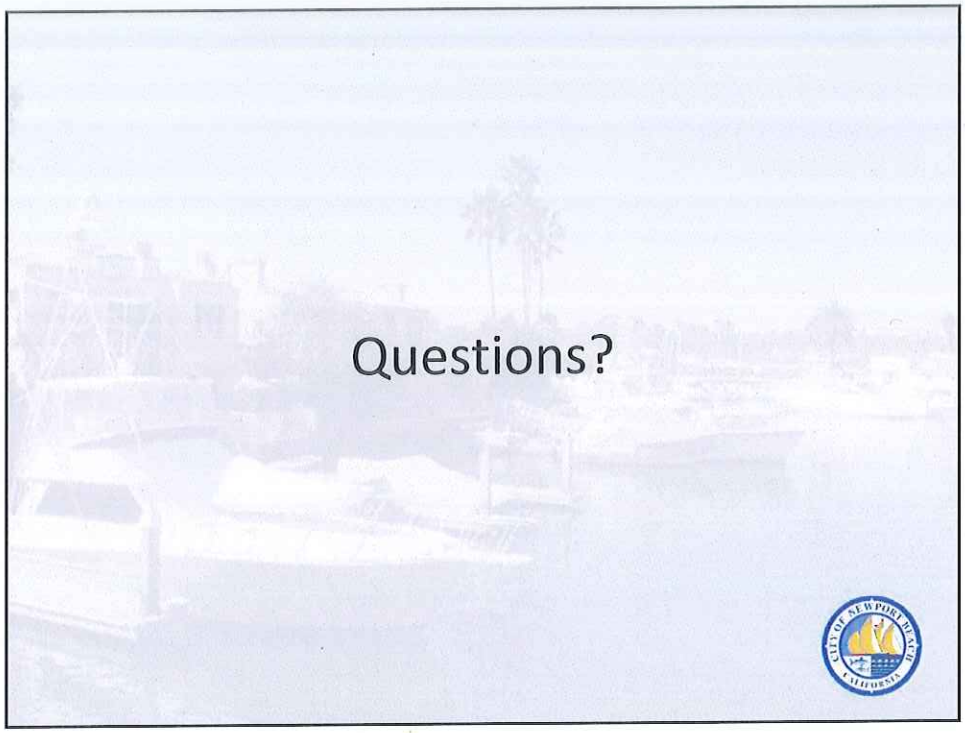
Total Project: $2,275,400
Grant: $1,592,780
Match: $682,620

Tier II Projects – Awarded
Big Canyon Restoration/Wetlands Project

13

The "Numbers"

- Total Projects: $3,120,400
- Total Grants: $2,147,780
- Total Match: $972,620 *


Questions?

Ocean Friendly Gardens™ Yard Sign Criteria

An Ocean Friendly Garden (OFG) is a garden that applies CPR - Conservation, Permeability, and Retention© - to revive the health of our watersheds and oceans

An OFG Sign will be awarded to any garden that achieves the following criteria:

CONSERVATION

Turf Areas

- ☐ Climate-appropriate turf grass is limited to 20% of total square footage of the landscaped area.
  - ☐ Turf grass is limited to only those areas where it serves a specific purpose (documented play area).
  - ☐ Turf grass is maintained organically without synthetic fertilizers and never over-watered.
  - ☐ Turf grass is kept away from the perimeter of the garden, where irrigation overspray is hard to control.
- ☐ Cool season turf grass is not in front yard gardens in areas receiving less than an average 44 inches of annual rainfall.
- ☐ Warm season turf grass, if present, is not over-seeded with cool season grass during winter months.

Irrigation

- ☐ No automatic irrigation is utilized OR:
- ☐ Irrigation system is in good repair (no breaks or leaks) with no visible signs from stains on nearby hard surfaces or erosion on vegetated surfaces from repeated overspray or runoff. (See maintenance details below)
- ☐ No spray irrigation of any kind is installed in areas less than 10 feet wide OR a total surface area of less than 100 square feet.
- ☐ Drip irrigation is ½ inch diameter tubing or larger -- utilizing either line source ("in-line") OR point source emitters ("on line").
  - ☐ No 1/4" diameter irrigation tubing is present, except where needed for irrigating containers and raised beds. (See maintenance details below)
- ☐ Hoses have shut-off attachments.
- ☐ A weather-based irrigation controller (WBIC) or "smart" irrigation controller is installed OR
- ☐ Absent a WBIC, the irrigation controller has a rain shut-off installed.

Mulch

- ☐ A minimum of 2 inches to 4 inches of natural woodchip mulch is present in all planted and open areas.
- ☐ 50% or more of the woodchip mulch must be smaller than 1 inch in length or diameter.
- ☐ Small open mulch-free areas are permitted if they are designated for native bee or insect habitat.

Plants

- ☐ Plants are grouped according to plant community or hydrozones including:
  - ☐ Similar sunlight exposure, water requirements, root depth, soil type, hardiness and temperature adaptation, and/or size at maturity.
- ☐ New gardens are planted with sufficient space between plants to accommodate mature growth without over-crowding, and to minimize pruning at maturity.
- ☐ Plants requiring regular shearing are not permitted, unless they are edible or produce edible fruit.

☐ Plant material is 80% climate-appropriate unless it is edible or produces edible fruit. (Climate-appropriate plant material is defined as plant material with a Species Factor or Crop Co-efficient of 50% or less or is described by reliable local references as a "medium" water-using plant in the particular climate. In California, use www.water.ca.gov/wateruseefficiency/docs/ for Species Factors.)

☐ Local native plant material is utilized for at least 10% of the visible garden area, whether or not the other plant material is edible or produces edible fruit.

☐ No invasive species are present. Invasive species are defined as those listed on the local Invasive Plant Council website as invasive or on the "watch list". (General information at: http://plants.usda.gov/java/noxiousDriver, and in California http://www.cal-ipc.org.)

Water Features

☐ Water features may improve the habitat of the garden and are allowed within these guidelines:

- ☐ Water is recycled by the water feature.
- ☐ Open water features are covered at least 50% by vegetation,
- ☐ All water features are maintained without chemicals or additives that are toxic to fish.
- ☐ Overflow from the water feature drains into a vegetated area.

☐ Swimming pools and chemically treated water bodies are drained to sewer systems.

☐ Swimming pools must be covered to minimize evaporation when not in use.

PERMEABILITY

Healthy Living Soil

☐ Soil health is maintained organically without chemical additives.

☐ Soil health is maintained by the addition of compost, compost tea, and worm castings.

☐ Soil is not visible beneath a mulch layer, EXCEPT

- ☐ Areas 4 inches-12 inches around the crown of woody plants should remain un-mulched, and
- ☐ Areas 12 inches to 60 inches around the trunks of trees should remain un-mulched.
- ☐ These un-mulched areas should be minimized, but depends on the size of tree/plant crown.

Permeable Hardscape

☐ Walkways and patios are made permeable with

- ☐ Plants, mulch or decomposed granite in gaps between pavers or other hard surfaces; OR
- ☐ Materials that permit water to "flow-through," e.g., permeable concrete or asphalt.

☐ Impermeable surfaces or minimally permeable surfaces, such as permeable pavers or decomposed granite, are graded to direct excess surface flow of water into adjacent vegetated areas.

☐ Existing impermeable surfaces such as driveways or large patio areas have been altered to direct surface flow of water into adjacent vegetated areas or retention/detention devices.

RETENTION

Downspout Re-direct

☐ If gutters are installed, all visible downspouts are directed away from impermeable surfaces into vegetated areas, mulched areas or retention/detention devices.

- ☐ Rain chains and other devices to slow the fall of water are recommended as a replacement for downspouts.

☐ If gutters are not installed, surfaces beneath the roof eaves are EITHER

- ☐ Vegetated with hearty plants that can withstand the beating; OR
- ☐ Covered with mulch, gravel or other sturdy and permeable materials, AND
- ☐ Hardscape surfaces beneath roof eaves are altered to create areas of permeability and direct surface flow of rainwater into vegetated or mulched areas or retention/detention devices.

☐ Drains carrying roof runoff or surface drain runoff from back yards or areas not visible to the street are EITHER:

- ☐ Directed into rainbarrels or cisterns at the downspouts to slow and reduce the flow of water into the drainage system, OR
- ☐ Disconnected from their overflow to street and re-directed into a vegetated or mulched area.

Sponge Gardens

☐ The visible garden area has been designed to capture as much of the rainfall from rooftops and other impermeable surfaces as possible.

☐ The flat areas on the property have been replaced with high and low contoured areas ("graded retention areas") to prevent rainfall from "sheeting" across the garden and off the property - helping to retain the first 1" of rainwater after a dry spell: AND/OR

☐ A dry creek bed or vegetated swale ("bioswale") captures the majority of the surface flow of downspout water and water from adjacent hard surfaces, creating sufficient area to slow, spread and sink it.

- ☐ Dry creek beds or vegetated swales are designed to hold at least 1" of rain from roof and adjacent hard surfaces, AND
- ☐ Rainfall in excess of 1" or the water-holding capacity of the garden, whichever is greater, is safely directed off-site after having been run through vegetated areas, including bioswales and creek beds, to remove pollutants and retain sediment.

☐ At least one tree or very large shrub has been planted at its proper distance from hard surfaces and buildings to help naturally store water for the entire garden.

Retention Devices

☐ Rainbarrels or above-ground cisterns are visible and are

- ☐ Installed properly in accordance with any prevailing local building standards or codes,
- ☐ Secured for safety purposes, and
- ☐ Overflow into vegetated or mulched areas, AND/OR

☐ Below surface retention areas and devices such as dry wells or cisterns are utilized to do the same.

Maintenance Details

1. Valve assemblies installed properly & in permeable areas (preferably surrounded by mulch or gravel).
2. Irrigation shut-off valves are easily identified.
3. Separate irrigation valves are utilized for each hydrozone (see "hydrozone" description in 4a below).
4. Back-flow prevention and pressure regulation is visible in or at the valve assembly.

Irrigation Details

1. Spray irrigation is matched precipitation, "multi-stream, multi-trajectory."
2. Spray irrigation requires anti-drain check valves to prevent low head drainage.
3. Spray irrigation heads of any kind are installed at least 24 inches from hard surfaces and buildings.